CONTRACTING WITHIN THE NAVY LABORATORIES: A CRITICAL EXAMINATION

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Monterey, California

THESIS

CONTRACTING WITHIN THE NAVY LABORATORIES;
A CRITICAL EXAMINATION

by

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December 1979

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REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)
Contracting in the Navy Laboratories; A Critical Examination

5. TYPE OF REPORT & PERIOD COVERED
Master's Thesis
December 1979

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)
Marvin E. McWherter
LCDR, SC
United States Navy

8. CONTRACT OR GRANT NUMBER(s)

9. PERFORMING ORGANIZATION NAME AND ADDRESS
Naval Postgraduate School
Monterey, California 93940

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS
Naval Postgraduate School
Monterey, California 93940

12. REPORT DATE
December 1979

13. NUMBER OF PAGES
115

14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)
Naval Postgraduate School
Monterey, California 93940

15. SECURITY CLASS. (of this report)
Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)
Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
Contract Types
Research and Development Contracting
Contracting Authority
Competition in R&D

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
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This thesis examines in depth several major contemporary problems perceived by laboratory personnel as hindrances to their effectiveness. These problems are broadly categorized into four main issues. First, the contract type best suited to R&D is addressed; second, the Contracting Authority levels and granting process are discussed; third, the restricting framework of existing regulations is examined; and fourth, the responsibilities of technical managers in the area of contract management are presented.

Conclusions and recommendations are offered which will provide a more efficient framework within which the R&D laboratory personnel can accomplish the specific missions assigned.

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1979

ABSTRACT

Contracting within the Research and Development arena is a unique process aimed at obtaining from industry increases in the technological base necessary for the acquisition of modern weapon systems. As a unique process, the application of traditional controls oftentimes presents real problems to those field level personnel operating in the contracting arena.

This thesis examines in depth several major contemporary problems perceived by laboratory personnel as hindrances to their effectiveness. These problems are broadly categorized into four main issues. First, the contract type best suited to R&D is addressed; second, the Contracting Authority levels and granting process are discussed; third, the restricting framework of existing regulations is examined; and fourth, the responsibilities of technical managers in the area of contract management are presented.

Conclusions and Recommendations are offered which will provide a more efficient framework within which the R&D laboratory personnel can accomplish the specific missions assigned.

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I. INTRODUCTION

A. OBJECTIVE OF RESEARCH

This research effort was aimed at the identification of contemporary problems within the contracting process at the Chief of Naval Material (CNM) Laboratories. Once specific problems were identified, the backgrounds were examined, the historical development of the issues studied, and viable solutions proposed.

It was intended that the research would result in positive solutions for implementation at both the field level and policy making levels within both the CNM lab structure and the contracting structure.

B. RESEARCH QUESTION

The primary research question upon which this effort was based was: What problems within the contracting process are perceived by technical and contracting personnel within the CNM lab community? This primary question then led to several secondary or ancillary questions.

1. How did the problems develop?
2. Why have no viable solutions been developed to date?
3. What are positive solutions to the problems?
4. What organizational component(s) within the Navy can take action to implement the solutions?

C. SCOPE

Due to the researcher's having served as the Contracting Officer at one of the CNM labs, and his resultant familiarity with both the lab structure and the contracting process, the scope of this effort was drawn around the relationship between these two factors. The involvement in the day-to-day operations provided a first hand perspective for some problems, however, the detached perspective during the research effort afforded the researcher an opportunity to more effectively evaluate other individuals' perceptions.

D. ASSUMPTIONS

The researcher assumed that the reader of this thesis possesses a basic understanding of both the laboratory environment and the Research and Development (R&D) contracting process employed within the Navy. Such personnel as technical managers and contracting managers serving at either CNM labs, policy level commands, or other support activities are the individuals for whom this study is primarily intended.

E. METHODOLOGY

Initially, a preliminary literature search was conducted to identify some contemporary problems within the R&D contracting arena. Interviews were conducted with senior policy level individuals to gain their perspectives on problem areas

which they perceived to be of importance. Subsequent to this preliminary effort, interviews were conducted with various field level technical and contracting personnel. This effort was the main thrust of the problem identification process. While not all labs were contacted, a representative sample was obtained, i.e., enough problems were identified to provide for fruitful research.

At this point, the existing literature was examined for background information on the problems identified, and problem analysis was conducted. The resulting conclusions and recommendations are those solely of the researcher.

F. REVIEW OF THE LITERATURE

Due primarily to the contemporary nature and significant specificity of the problems identified, the literature base consisted primarily of Government documents and working papers. A very limited amount of academic material or commercial literature was found to provide meaningful background information.

G. DEFINITIONS

1. Completion Contract

This contract type specifies delivery of an end product at a point in time. The description of the end product is provided in the schedule or statement of work,

and constitutes the scope of the effort. Upon delivery and acceptance of the end product, the contract is considered complete. If, under a cost reimbursement arrangement, the contractor has not completed work within the estimated cost, he is nontheless obligated to finish the effort as long as the Government funds the effort. Under a fixed price arrangement, the contractor is obligated to perform until the end product is delivered, assuming himself all costs above the established fixed price.

2. Term Contract

This contract type specifies as the scope of work a period of time, usually expressed in man-days, at the end of which the contract is considered complete, regardless of the progress made. The contractor is not obligated to continue, even if the Government is willing to fund additional effort.

3. Basic Ordering Agreement

A written instrument of understanding (not a legally enforceable contract per se) between the contractor and the Government. It sets forth the contract clauses applicable to future procurements entered into between the parties during the term of the agreement. It is used to eliminate extensive and costly negotiations when a substantial number of separate contracts may be entered into with a contractor over a period of time.

4. Contract Management Review (CMR)

A CMR is conducted by a regional contracting office to assess the effectiveness of a field contracting office. It is similar to an operational or compliance audit, in that non-compliances with regulations are cited and more effective methods of operating are recommended. The CMR report is used during the decision process for granting increased levels of contracting authority.

5. Determination and Findings (D&F)

This is a written justification by a contracting officer or higher authority for (a) entering into contracts by negotiations, (b) making advance payments in negotiated contracts, or (c) determining the type of contract to be used. The Defense Acquisition Regulation requires D&F's to be approved at various levels from the contracting officer up through the Service Secretary.

H. ORGANIZATION OF STUDY

In addition to the Introduction, which provides the reader with the perspectives of the researcher and a description of the research effort in general, this thesis consists of three main segments.

1. Framework

This segment (Chapter II) initially identifies for the reader the CNM laboratory structure, the mission of these organizational units, and a description of how the Navy buys Research and Development. It then outlines the contracting process within the CNM lab arena, with specific emphasis on the unique nature of R&D contracting, and the relationship between CNM and the Naval Supply Systems Command (NAVSUP). Finally, the framework provides a brief outline of the regulatory system applicable to the R&D contracting process utilized by the CNM labs.

2. Issue Development

During the problem identification phase of this research effort, four main issues were addressed with near unanimity by both technical and contracting managers within the laboratory community. These four issues to be addressed and analyzed deal with (1) the appropriate contract type used in R&D (Chapter III), (2) the amount of contracting authority granted by NAVSUP, and the process by which it is granted (Chapter IV), (3) the restrictive framework within which the contracting is conducted (Chapter V), and (4) the responsibilities of laboratory personnel in the area of contract management (Chapter VI). For each of these issues, the background will be presented, the current status given, and a discussion of the problems will follow.

3. Conclusions/Recommendations

The researcher's conclusions and recommendations are presented in this final segment (Chapter VII). Conclusions drawn are the result of the research, with recommendations based upon feasible solutions to the problems.

II. FRAMEWORK

A. THE LABORATORY ENVIRONMENT

1. Laboratory Organization

In 1966, the Chief of Naval Material assumed command of the major Navy laboratories. During the subsequent years, consolidations were effected which resulted in the present laboratory structure as depicted in Appendix A. This research effort applies to seven of the eight CNM commanded laboratories. The Naval Personnel Research and Development Center (NPRDC) is excluded due to its rather specialized human resource research functions. The remaining seven CNM labs are more involved with weapon system development and primary research aimed at hardware. The following are the missions of the seven CNM Research facilities: [23:25]

a. NAVAL AIR DEVELOPMENT CENTER (NADC) - The principal Research, Development, Test and Evaluation (RDT&E) center for naval aircraft systems less aircraft-launched weapon systems.

b. NAVAL COASTAL SYSTEMS LABORATORY (NCSL) - The principal activity conducting RDT&E in support of Naval Missions and operations that take place primarily in the coastal (continental shelf) regions; includes RDT&E for mine countermeasures, diving and salvage, coastal and inshore defense (less ASW), swimmer operations and amphibious operations.

c. NAVAL OCEAN SYSTEMS CENTER (NOSC) - The principal RDT&E center for command, control and communications; ocean surveillance; surface and air launched undersea weapon systems and supporting technologies.

d. DAVID W. TAYLOR NAVAL SHIP R&D CENTER (DTNSR&DC) - The principal RDT&E center for Naval vehicles and logistics; provides RDT&E support to the U. S. Maritime Administration and maritime industry.

e. NAVAL SURFACE WEAPONS CENTER (NSWC) - The principal RDT&E center for surface weapons systems, ordnance, mines and strategic systems support.

f. NAVAL UNDERWATER SYSTEMS CENTER (NUSC) - The principal RDT&E center for submarine warfare and submarine weapon systems.

g. NAVAL WEAPONS CENTER (NWC) - The principal RDT&E center for air warfare systems (except ASW systems) and missile weapon systems.

Each laboratory plays a unique, but not mutually exclusive role in the overall research and development arena. However, due to the lack of an effective communication system and higher level coordination, there is some overlap of work assignments and technology exploration. [23:34] For this reason, and the fact that the labs are Navy Industial Fund activities, there is a sense of competition among various labs for sponsor funded work. This competitive spirit is judged by some to be a positive force in keeping the rate structures within affordable boundaries.

2. The Navy Research and Development Process

The basic intent of the in-house R&D effort as performed by the CNM labs is to develop products and technology for internal use. The customer, so to speak, at whom the research and development effort is aimed is the Navy user, ultimately the fleet operating forces. Occasionally, due to some overlap of technological application, other military services can benefit from potential developments. This effort can be broadly classified into two areas: (1) technology base effort involving the application of various alternative solutions to new Navy requirements, and (2) systems development wherein specific military capabilities are addressed in an engineering sense. [19]

The question of why the Government has in-house laboratories to perform the missions described has been addressed regularly throughout the past. In fact, since 1960, there have been 18 studies conducted on the in-house labs, all of them universally united in their conclusion that the research mission of the Government can best be served by retaining an in-house capability. The reasons for this uniform conclusion are summarized in six major points: [31:3]

First, the laboratories are required to infuse the art of the possible into military planning.

Second, laboratories are required to maintain the technology base in mission areas associated with the services' requirements and in particular in those areas where there is not heavy industrial involvement.

Third, the laboratories are required to couple technological opportunities to operational needs; to identify when the

technological opportunities become available which can significantly impact the capability of operational forces.

Fourth, and this is a most important role, the laboratories serve as the Services "smart buyer" in defense systems acquisition. American industry has the capability to conceive, to demonstrate, and to develop competent military hardware. However, experience has shown time and time again that when there has not been a "smart buyer" working with the contractor, the government has obtained systems which would not satisfy the requirement in the operational environment. Without a "smart buyer", the government has found it impossible to compete productions on those systems.

Fifth, the laboratories are required to respond rapidly in times of national crisis. The job that the laboratories did early in the Viet Nam conflict is exemplary.

Sixth, the laboratories are required to maintain and provide specialized facilities which are not practical in the private sector.

While the Navy labs, then, have such a diverse and comprehensive role to play in the entire acquisition cycle, it is imperative that they be operated as efficiently as is possible. This research effort was directed at one area of operations wherein the top level management of the laboratory community feels constrained in its ability to effect cost and time savings - the contracting process. [3]

B. THE RESEARCH AND DEVELOPMENT CONTRACTING PROCESS

As was stated in Chapter I, it is assumed that the reader is familiar with the contracting process as employed by DOD in general, and the Navy labs in particular. However, to provide a framework from which several distinctions can be drawn as they relate to R&D contracting, the basic phases in the process and overall conceptual background are presented for clarification.

1. Contracting Phases

a. Planning

This phases involves a team effort between the technical community and the contracting agent to determine the best overall strategy to be used to obtain the required items or services. Such concerns as competition, socio-economic programs, adequacy of the specification, required delivery date, and all necessary approvals within the contracting cycle are addressed. It is understood that at this time the users and technical community have translated the need into a specification with adequate funding provided.

b. Solicitation

This phase involves the actual mailing of a solicitation to industry, expressing the Government's needs as completely yet succinctly as possible.

c. Source Evaluation and Selection

Upon receipt of industry's proposals, the evaluation and selection process begins. This involves different procedures, depending upon whether the procurement is being formally advertised or negotiated. Briefly, the selection in formal advertising is based upon the lowest bid submitted, while in a negotiated procurement, the cost and technical approaches are considered concurrently.

d. Negotiations

This phase involves mutual discussions between the Government and contractor(s) to arrive at what both parties

agree to as fair and reasonable contract terms (cost or price, specifications, clauses, etc.).

e. Award

This phase is the culmination of all efforts to date in the process. The contract is issued, with all terms and conditions defined and agreed upon by both parties.

f. Contract Administration

This final phase involves the monitoring of the work being done, the making of any necessary changes, and the closing out of all related records during and after performance and delivery by the contractor.

2. Basic Concepts

During the contracting phases just described, several basic concepts were found to provide the baseline guidance for all DOD procurement:

a. Formal advertising is the preferred method of contracting - vice negotiation.

b. Maximum competition shall be obtained in all cases.

c. The Government shall state its minimum needs to industry.

d. An arms-length relationship shall exist at all times within the contracting process.

3. The Unique Nature of Research and Development

Belden and Cammack describe the process of contracting for R&D as follows:

"The procurement of research requirements from the private sector of the economy represents another distinct class of procurement operations with characteristics and techniques peculiar to the process of acquiring basic knowledge. By its very nature, procurement of research involves close association with the educational and scientific community and has as its objective, the identification and use of the best technical competence that can be obtained (emphasis added). Contracting for research is largely a process of obtaining the best efforts of a group of individuals to produce a much less precisely definable product than is bought through other types of procurement." [2:6]

Comparing this description with the four previously outlined aspects of DOD baseline guidance results in an interesting anomaly.

a. Formal Advertising

The prerequisites for the use of formal advertising are, (1) adequate specifications, (2) adequate price competition, (3) adequate time, and (4) lowest price as the basis for award. [2:95] In the typical R&D procurements researched, the only one of these four prerequisites oftentimes present was adequate time. Even this may not be present in many instances as indicated by one of the laboratories' many reasons for existence - to respond rapidly in times of national crisis. [31:3] Several interviewees stated that the product is rarely completely definable, there is seldom a large competitive base within industry, and seldom is price used as the basis for award. Rather, an undefined product is often purchased from a technological innovator on a sole source basis. When technical competition does exist, the technical approach or understanding of the requirement is used as the basis for award, thus negotiation is required.

b. Maximum Competition

It appears that the goal to obtain maximum competition is not consistent with the R&D goal of drawing upon the best talent within the educational and scientific community. When advancing the state of the art in a given technological area, the R&D manager is not interested in giving the contract to the low bidder among a large group of competing firms. This would be a risky course of action, one which could result in little, if any, progress towards attaining the technical goals of the procurement. Additionally, the R&D industry is often so specialized as to preclude the existence of competition. In fact, a review by the researcher of sample awards made by the labs during the first half of FY 79 indicates that less than 25 percent were made on a competitive basis. If these awards were stratified to include R&D awards only, the researcher contends that this figure would be even lower.

c. Minimum Needs

While this goal is highly desirable in the procurement of repair parts, base support services, and other areas of contracting, when applying it to R&D, the anomaly becomes readily apparent. R&D contracting is attempting to buy the best technical effort available, not the cheapest, while still meeting minimum needs. For this reason, the evaluation plans for many R&D procurements are weighted so as to result in the selection of the best contractor. It is the general concensus among technical managers interviewed,

that when dealing with advanced technology, it is essential that the public sector monies be spent where the most fruitful results are anticipated, i.e., from a highly competent, proven scientific team.

d. Arms-length Relationship

Again, the normal contracting process dictates that the contractor not be closely monitored, but that he be given the independence to perform as agreed to in the terms and conditions of the contract. This applies to both hardware and services types of procurements. Realizing that when acquiring major weapons systems, a great deal of dialogue must ensue to protect the Government's interests, the regulatory framework regarding changes, disputes, and claims assumes that the amount of extra-contractual contact between the Government and industry technical counterparts will be limited. In the R&D contracting arena, however, the mutual benefit obtained from a regular, meaningful dialogue is recognized as essential to the process of advancing technology. In fact, the contract types utilized within R&D contracting should recognize a significant amount of dialogue. The close association between Government and industry which Belden and Cammack speak to is regarded by laboratory managers as critical to their success. [15]

4. Chief of Naval Material vs. Naval Supply Systems Command

As depicted in Appendix A, the organizational relationship between the labs and NAVSUP is an interesting one. The

labs report to CNM for their line authority. The success or failure of the labs to meet their mission goals and objectives, the resources necessary for this effort, the reputations of the labs in meeting their obligation to customers, and the continued development of the labs as viable entities are of immediate concern to CNM. NAVSUP, on the other hand, controls the contracting authority for each lab, establishes contracting guidelines to follow, and is responsible for the evaluation of the labs contracting proficiency.

With NAVSUP reporting to CNM, the uniqueness of the labs relationships with each become more apparent. Other field activities report to either NAVSUP, as in the case of Navy Regional Contracting Offices (NRCO), Naval Supply Centers (NSC), etc., or to other Systems Commands, which are at the same organizational level as NAVSUP. The resultant frustration experienced by the laboratory manager, as indicated to the researcher during various interviews, stems from his being accountable to CNM for his overall performance, but to NAVSUP, a subordinate command to CNM, for his contracting authority.

5. Regulatory System

The regulatory framework within which the contracting process is conducted is comprised of four main components - Public Law, the Defense Acquisition Regulations (DAR), General Accounting Office Decisions, and Executive Branch Policy. [2:73-88] A brief description of each is provided for the reader's edification.

a. Public Law

At present there are estimated to be over 2000 laws on the books which have some bearing on the contracting process. [44] While the great majority have a very minor impact, many are specifically addressed to contracting. The contracting officer and his team members must be mindful of the provisions of these laws so as to conduct their business within the framework intended by Congress. Some of the most important legislation bearing on contracting is:

(1) Service Contract Act of 1965

(2) Walsh-Healy Public Contracts Act

(3) Truth in Negotiation Act

(4) Buy American Act

(5) Small Business Act

(6) Anti-Deficiency Act

(7) Armed Services Procurement Act of 1947

b. Defense Acquisition Regulation (DAR)

Formerly known as the Armed Services Procurement Regulation (ASPR), and established by the Armed Services Procurement Act of 1947, the DAR provides a uniform set of statutory based regulations within which DOD must operate. The underlying principles of military procurement are addressed in great detail, from types of contracts to defense contract financing. A new regulation, the Federal Acquisition Regulation (FAR) is being written by the Office of Federal Procurement policy (OFPP) and will contain basic policy and procedural

guidance, while the DAR will contain implementation procedures unique to DOD.

c. General Accounting Office Decisions

> "Through his statutory power to settle and adjust public accounts . . . the Comptroller General exercises final review authority over the procurement activities of the Government." [2:74]

The contracting officer within the R&D community therefore, must answer to the Comptroller General for the propriety of his actions, and the validity of the procedures he uses, therefore, the Comptroller General has a substantial impact upon the legal framework within which contracts are executed and administered.

d. Executive Branch Policy

In addition to the Navy's own implementing contracting guidance - Navy Contract Directives and the Field Purchasing Manual (NAVSUP 467), the Office of Federal Procurement Policy (OFPP) issues directives and memoranda periodically which govern the actions of contracting officers. Examples of such guidance are:

(1) OMB Circular A-109, subject: Acquisition of Major Systems

(2) OMB Circular A-76, subject: Acquiring of Commercial or Industrial products or services needed by the Government.

The Navy has internally a broad base of instructions which apply to the contracting process - too many to delineate at this juncture. Suffice it to say that the

contracting officer and his team have a challenging task before them at all times in light of the entire sphere of outside guidance with which they must comply while meeting program goals.

III. RESEARCH AND DEVELOPMENT CONTRACT FORMAT

A. BACKGROUND

1. Criticality of Contract Type

During the performance of his multi-faceted role as an acquisition team member, the Contracting Officer exercises many responsibilities. Among these complex duties is the selection of the contract-type best suited to the requirement. Research has indicated that this decision is critical to the success of any acquisition for several reasons:

a. The proper balance of risk distributed between the Government and the contractor is essential to incentivize performance. The contract type allocates this risk.

b. The cost to both the Government and the contractor in the administration of the contract should be kept to a minimum while still ensuring that proper controls are present. The type of contract determines cost of administration to a great degree.

c. An appropriate level of control over the contractor's performance is critical to successful completion. The contract type determines to some extent the level of control possible within legal boundaries.

The issue to be discussed here addresses a contract type not specifically described in the Defense Acquisition

Regulation (DAR) - the Work Assignment Contract (WAC). Technically, these contracts can be categorized within one of the general cost-type classifications, i.e., Cost-Plus-Fixed-Fee (CPFF) or Cost-Plus-Award-Fee (CPAF). However, the unique ordering provisions and administration aspects set the WAC apart from either a normal completion contract, or a standard term level-of-effort services contract.

2. Work Assignment Contract Development

In the mid 1960's, the Navy Regional Procurement Office in Los Angeles (now Long Beach) working with three of the Navy's principal RDT&E centers (the Naval Weapons Center, China Lake, the Pacific Missile Test Center, Pt. Mugu, and the Naval Undersea Center, San Diego), recognized a need for a unique contract type for basically two classifications of procurements. The first was the R&D service contract issued to provide white-collar, highly technical services on a continuing basis over an extended period. The second was the development hardware contract. In both cases, the nature of the work to be performed was wide-ranging, and it was impossible for the user to define even in imprecise terms the extent of effort which would be required throughout the proposed term of the contract.

The solution developed became known as the Work Assignment Contract. Basically, it involves the issuance (competitively or sole source) of a master contract by the Contracting Officer, outlining in very simple terms the broad

nature of work to be performed. Subsequently, as more definitive segments of work are identified, Work Assignments (WA's) or Task Orders (TO's) are issued by designated ordering officers against the master contract. It is similar in nature, therefore, to a delivery order contract. The ordering officers are generally located within the requiring activity organizations.

3. Conditions for Use of Work Assignment Contracts

As mentioned previously, there are two basic categories of WAC's - the R&D service contract and the hardware development contract. The line between these two types often becomes rather cloudy, since in many hardware development efforts the greater majority of the costs associated with the contracts are engineering labor, with very little material costs being incurred. Nonetheless, a closer examination of the application of the WAC to each of these requirements is in order.

In looking at the R&D services area, research indicates that the services involved are highly technical in nature and easily distinguishable from a blue-collar services situation. In the latter situation, a general specification is included in the contract, the contractor performs as required, the Government inspects the work performed, and payment is made. These types of contracts are generally fixed price or time and material. In contrast, the white-collar R&D services

are procured most often under a cost-type contract, there is frequent dialogue between the contractor and the Government, and the results of performance are often times very difficult to "inspect and accept".

A typical example of the application of a WAC is the procurement of "analytical and empirical investigations in the areas of target vulnerability/survivability, warhead design, terminal ballistics, blast loading and response, and component vulnerability". This scope of work statement was extracted from a contract issued to a research firm in 1976. One would be inclined to admit that the scope is rather broad. In fact, detractors from the WAC concept often characterize the scope of work as being too broad; hence, subject to misuse. [26:11] However, when further analyzing the use of the WAC in this type of setting, the developer's need for a broad scope becomes more apparent.

In this particular case, a systems command had funded a major laboratory to support an exploratory development program. The broad general direction of the ensuing research was known, however, no specific requirements could be identified. Due to a lack of sufficient in-house expertise, the lab had to contract for many of the scientific studies necessary for program progress. Imagine now, the technial project head establishing small increments of work to be performed independently and sequentially. If the only contracting instruments available were completion or term type contracts,

the individual increments would have to be contracted for separately. Originators of the WAC indicate that this situation would be untenable from a program continuity perspective.

With the WAC concept, a master contract is awarded, outlining in broad terms the work to be done, and containing all required terms and conditions. As new work packages are identified, a work assignment is issued to the contractor, citing the specifics of performance, the estimated cost of the effort, any unique reporting requirements and an estimated date for completion.

The major advantage as regarded by users of the WAC in the area of R&D services is the ability to respond quickly to sponsor requests for research or development studies and investigations; and when coupled with potential savings in contracting effort required, the WAC appears even more attractive to users. Consider the case of twenty different project heads all requiring similar services in a particular technical field, within thirty days of each other and amounting to $20,000. Without a WAC, it would be necessary to negotiate twenty different contracts with similar scopes or attempt to combine them in a single procurement. This latter option would mean a significant delay in performance for all but the last one. However, with a WAC in force, the administrative process of issuing each of the twenty WA's could be accomplished in a matter of days, as research has shown in a review of sample lead time reports at labs.

The hardware development effort also provides an application of the WAC concept. Consider again, a sponsor funded request to advance the state-of-the-art in the area of rocket motor research. All that is known initially by the lab is that the existing designs are not performing at a satisfactory level. New designs, materials or assembly processes must be examined to determine if a more suitable motor can be developed. Since a typical hardware development effort is disjointed, with many areas of investigation resulting in dead-ends, the use of sequential completion contracts for each segment of the developmental effort again would result in a very lengthy process. [39]

Under the WAC concept, the master contract would be issued requiring a certain level of effort be performed towards the development of a new rocket motor. The specific areas of investigation would be performed under individual WA's. As new approaches are discovered, new WA's are issued for their study, while WA's are cancelled for areas of research found to be fruitless. Turning the contractor on and off becomes an administrative simple task, relative to the issuance of individual contracts.

4. Special Considerations

The user, in recommending a specific contract type, and the Contracting Officer, in making the determination, must ensure that the conditions for its use are met if a WAC is considered. This would be true for any contract type.

The Government's objective in choosing a contract type is generally to have the contractor bear the risk of performance. [7:225] That is, issue the contract for a specific product, or period of performance in the case of a service contract, and remain at arms length for the duration. The contractor is expected to make all decisions during performance unless normal Government surveillance dictates interventions. During a developmental program's evolution, however, technical managers indicate that it is often not desirable for a contractor to decide the most expedient approach to take when the wasting of taxpayer dollars is a potential result. Redirection becomes the norm rather than the exception, as evidenced in those contracts researched.

For this reason, the use of the WAC to eliminate mid-contract redirection is considered by interviewees to be highly desirable. Many programs are sequential in most part and subsequent studies will depend upon or be a function of previous studies. Without the ability to technically evaluate the study efforts and to direct subsequent lines of inquiry, the Government's position in the overall progress of the program is significantly impaired.

In considering the various factors which constitute the basis for determination of contract type, the following are pertinent in most developmental programs: [34:H-1]

(a) The type and complexity of the item.

(b) The stability of the design.

(c) The firmness/specificity of the technical specification package.

(d) Relevant historical pricing data.

(e) Prior experience in similar development efforts.

Research indicates that all of the above factors, when applied to a major hardware development program indicate that a flexible contract vehicle is required.

In the case of a WAC for R&D services, users point out that one of the key considerations is the appointment of the Contracting Officer's Technical Representative (COTR). As was addressed previously, many service WAC's are designed for a multi-user environment. Services such as test data analysis, maintainability studies, etc., could conceivably be required by nearly every department at a major R&D shore installation. In order to ensure that all WA's issued to the contractor are formated properly and contain the required level of technical specificity, they are normally screened by an individual who acts as the COTR. According to field personnel interviewed, the COTR must be capable of establishing priorities among all work sent to the contractor, must be able to interface well with both the users and the contractor personnel, and must command a high enough level of respect from the Command that support is provided in settling inter-departmental disputes. The COTR works closely with the contracts personnel in the administration of the contract, and in the case of a CPAF contract, normally chairs the

evaluation board. Some specific problems relating to the COTR concept will be addressed in Chapter VI.

A final consideration which the Contracting Officer must address is the level of control imposed upon the ordering officer and COTR regarding such factors as WA/TO format, review and approval levels, contractor proposal evaluation, and final approval dollar limitations. NAVSUP has issued a very lengthy instruction, detailing on a universal basis many of these controls. An example is that all WA's/TO's over $50,000 must be approved by the Contracting Officer prior to issuance to the contractor. This instruction is addressed in greater detail in Chapter VI.

5. Mission Essentiality

The WAC as it is used today by the R&D community is considered by both technical and contracting personnel to be a critical asset to successful program completion. Senior level technical personnel emphasize that both the services and hardware development areas require a great deal of flexibility in R&D acquisitions. Sponsor requests are sporadic and time-constrained. To maintain a high level of professional credibility, the engineering community must have access to a contractual form which provides them this requisite flexibility. Additionally, the cost-control necessary in austere budget years is facilitated by contracts which can be quickly turned off or on.

The key benefit of a WAC from the perspective of the contracting community researched is the timeliness with which WA's and TO's can be issued when compared with individual procurements of similar dollar value. The research shows that a typical $50,000 contract (CPFF) takes between 50 and 60 days to award. A similar effort, issued on a WA takes between 10 and 15 days, much of this being mail time for obtaining the contractor's signature. Emergency or highly critical requirements can be processed in hours. The main objective as perceived by lab contracting organization is responsive service. The WAC is deemed by users to enable the contract professionals to meet this objective while still meeting the regulatory requirements.

B. CURRENT STATUS

While the WAC concept as just described has been in operation for over a decade, it has only recently come under criticism by the Naval Audit Service (NAS), Western Region; criticism aimed at the basic instrument itself and the specific manner in which an individual laboratory was funding work accomplished under a WAC. [11] This research effort was aimed primarily at the question of contract-type vice funding difficulties. The options available and limitations regarding funding of contracts are not germane to this research.

The WAC contracts researched and now in use by the laboratories are generally of the cost-plus-fixed-fee (CPFF) level of effort (LOE) variety. They are written with a very broad scope of work in Section E (Supplies/Services and Prices) of the contract. In Section F (Description/Specifications), additional detail is used describing the various categories of work to be performed. Sections E and F of a typical WAC, along with an applicable individual Work Assignment appear in Appendix B of this study. The key issue raised by the NAS was that no work was required by the contractor upon signing an executed contract. Only upon acceptance of the first Work Assignment (WA) or Task Order (T)) was the contractor obligated to perform. As such, the NAS contends that these contracts are in reality no different than Basic Ordering Agreements (BOA). The categorization of WAC's as BOA's however, subjects the requiring or contracting personnel to the utilization of WAC's in accordance with the DAR guidance on BOA's, i.e., each requirement or new work package must be synopsized and procured competitively, or sole source when appropriate.

C. PROBLEM ANALYSIS

Now that (1) the evolution of the WAC concept has been presented, outlining the developers' rationale and perceptions as to the WAC's desirability and indeed essentiality to the R&D contracting process, and (2) the current position

taken by the Naval Audit Service (NAS) regarding the WAC's illegality as presently used, an analysis of the Audit Service alternatives is in order.

The specific recommendations offered by the NAS concerning the inappropriate use of WAC's in R&D contracting were to either convert the existing WAC's to BOA's or obtain a deviation for each proposed use of a WAC in accordance with DAR Section 3-401(a)(2). [11] Both of these recommendations, while entirely appropriate within the existing regulatory framework, fail to address the needs of users interviewed. The situation perceived in the labs is that they have been expected to conform their needs to existing contract types rather than the converse situation of flexible guidance to be applied to flexible needs.

Under a BOA, the R&D community researched would lose the responsiveness required to meet program goals, since each identifiable work package would be necessarily synopsized, competed when appropriate, and negotiated for award. Laboratory managers interviewed expressed grave concern for program continuity, schedule expansions, and the very basic ability of the labs to perform their missions effectively.

The second NAS recommendation, to obtain a one-time deviation in each instance wherein the contracting officer determines that a WAC is the only appropriate contract vehicle, is perceived by field personnel as a needless administrative burden, imposing unproductive demands in both headquarters and field level personnel.

The research found some limited support for the concept of issuing indefinite quantity contracts with the schedule calling for an estimated number of man hours of various types, tied to a broad scope of work in Section F of such contracts. The researcher feels that this option is totally inappropriate, since the amount of technical direction which can be given under current DAR guidance would be limited to minor clarifications or identification of task details, such as test data to be analyzed. Enlarging technical direction to include detailed task orders is not appropriate under the current guidance.

WAC supporters in the field deem such use of an indefinite quantity contract to be an insurmountable burden, since in all cases wherein it would be used, a statement of work extensive enough to guide even the most astute contractor throughout performance of the specified estimated effort is considered impossible to draft in advance of most of the preliminary work in a typical R&D program. [15]

The researcher considers it necessary to point out at this juncture that proponents and users of the WAC contracts have an obligation to the integrity of the Government-contractor relationship. This obligation involves a professional commitment to provide technical direction only, and not assume the role of managing the contractor and his workforce. Such a role would be in clear violation of the prohibition against personal services contracts.

IV. CONTRACTING AUTHORITY

A. BACKGROUND

1. Issue Identification

The subject of appropriate levels of contracting authority for the CNM Laboratories is not new. Since the inception of the labs, a constant battle has been waged between the laboratory personnel and the Naval Supply Systems Command. [22] The net result to date is that some labs have been successful in obtaining increased authority, while others are still waging the battle. Table I depicts the present levels of contracting authority for the CNM labs.

Table I

CNM LABORATORY CONTRACTING AUTHORITY LEVELS	
NADC Warminster NSWC Dahlgren	Unlimited Authority
NSR&DC, Carderock NOSC, San Diego NWC, China Lake NCSL, Panama City	$100K Authority
NUSC, Newport	$10K Authority

This issue addresses field level personnel's current desires for a more comprehensive decision process in determining increased contracting authority for the Navy labs. The key arguments in favor of decentralization of R&D contracting authority are presented, as well as the counter arguments by those who would preserve the integrity of the central buying offices. Each argument is analyzed based upon the research.

2. How Contracting Authority is Granted

All field purchasing activities (including the Navy Laboratories) comprising the Navy Field Procurement System are responsible to the Commander, Naval Supply Systems Command (NAVSUP) for the proper performance of the purchase function under his delegated contracting authority. As manager of the Navy Field Procurement System, NAVSUP provides policy direction, technical assistance, performance appraisal, contract planning, and other aspects of functional management, including analysis and evaluation of necessary contracting authority, capability, staffing and training. In certain geographical areas, NAVSUP exercises these management functions through Naval Regional Contracts Offices (NRCO) or certain Supply Centers.

At the time the NRCO or area buying office concept was established in 1967, the major problems confronting NAVSUP were the management and control of over 200 purchasing activities. A renewed Congressional interest in small purchase

effectiveness, limited travel funds for performing advisory visits, and a diminshed headquarters staff led to the concept of decentralization by geographic areas. The two primary missions of the NRCO as originally stated are: [22]

- Major Contract Support with improved management, better buyers through training, and a closer relationship with the customer activities.
- Management responsibility for all purchase activity within a geographic area.

Working within this regionally centralized framework, contracting support for those labs not possessing unlimited contracting authority is provided by the NRCO's. Requests for increased authority are forwarded through the NRCO involved to NAVSUP, who makes the determination. Oftentimes, the CNM lab will forward the request via CNM for an endorsement. NAVSUP utilizes an internally developed algorithm (Appendix C) for deciding the appropriate level of contracting authority. This algorithm takes into account such factors as workload, proximity to a NRCO, productivity, and Procurement Administrative Lead Time (PALT). Additionally, the comments provided by the responsible NRCO, as well as the criticality of the lab's business to the organizational viability of the NRCO are scrutinized. [17] The NRCO comments are generally in the form of an updated evaluation of the lab's effectiveness in performing the contracting mission.

B. CURRENT STATUS

The present system utilized to determine the appropriate level of contracting authority for laboratories is perceived as deficient in two major areas by field personnel interviewed. First, the real issues which need to be addressed during such a determination process are considered to be either not addressed or clouded by surface issues of dubious validity. Secondly, the actual flow of the request and review cycle leads to organization conflicts. These two factors have, according to those laboratory personnel interviewed operating with less than the desired level of contracting authority, contributed to inefficiency in the contracting process. The following analysis will examine both of these areas, with particular emphasis on the merits of the traditional arguments in favor of centralization, when applied to CNM labs.

C. PROBLEM ANALYSIS

1. Centralization - A Question of Efficiency

Proponents of continued centralization of contracting authority within the NRCO's and NSC's have used several arguments. The most common is that only the central buying offices possess the necessary trained expertise in contracting personnel, and that due to a shortage of qualified contracting specialists, newly established unlimited contracting offices

would likely fail to acquire the requisite staff. In contrast, during the period 1974-1978, the Naval Weapons Center has had its contracting authority increased in three stages from $2500 to $100,000. Each incremental increase has meant a need for more trained personnel. These required personnel have been obtained without major difficulty, even in an isolated area over 100 miles from civilization! Hence, the laboratory manager can obtain qualified personnel if he is committed to providing the resources to the contract area.

A second argument in favor of the central buying offices is that they provide a high level of consistency in policy implementation. Research has shown that while total decentralization may result in a more fragmented implementation of policy, the retention of management control by the regional offices could provide the desired continuity. The regional offices could continue to issue instructions and guidance to activities within their area even though a laboratory might have unlimited contracting authority.

From an economics standpoint, centralization proponents suggest that the large buying offices are more cost effective than smaller contracting shops dispersed throughout the region. A duplication of management or supervisory personnel and staff support would be required for each office, therefore centralization offers lower overall costs to the Navy. [29] What are the costs of placing a contract? In addition to the actual professional contracts personnel

costs and related staff costs, research has shown a significant cost for high-grade engineering personnel on travel to a regional buying office to clarify a statement of work or negotiation position. Additionally, the costs of lost lead time due to mail delays in processing the mountains of paperwork are considered by field personnel to be critical. The Naval Weapons Center in an informal analysis concluded that it could process all actions over its current $100,000 threshold with two less billets than it was estimated that NRCO Long Beach was devoting to the effort.

Within most of the labs today, a senior level staff of experienced GS-1102 contracting professionals exists to provide a matrix form of support to the technical community. Additionally, the necessary working level and management talent is in place to review the large dollar expenditures processed through the organization under WA's. Consequently, the only real addition necessary in these cases would be negotiators and counsel where not already on-site.

A final argument offered by centralization proponents is that decentralizing through the granting of unlimited authority to the labs would decimate the contracts divisions of the regional offices, and possibly lead to the loss of high grade military and civilian billets. While certain regional offices, such as NRCO Long Beach, would experience a reduction in their contracts workload and a change in the workload mix due to decentralization of contracting authority

for the labs, the overall impact on the system would be limited because the lab business as a percentage of the buying offices' totals is relatively small. [22]

In addition to the above arguments in support of centralization, the NAVSUP decision process examines another factor. The endorsement by the NRCO on a request for increased lab authority is used to measure the quality of the labs work. These endorsements are based upon recent Contract Management Reviews (CMR). Laboratory personnel interviewed contend that these CMR's are less than objective due to the NRCO's desires to continue doing the labs' contracting.

With these surface issues being utilized in evaluating contracting authority increase requests, several key issues considered by the labs to be of critical importance are left unaddressed.

2. Decentralization - A Question of Responsiveness

The proponents of further decentralization, i.e., increased contracting authority for each of the Navy's RDT&E laboratories have authored several arguments in support of their position. Perhaps as background for these arguments, five specific aspects of the role of the labs should be identified: [19:3]

a. Reservoir of technical expertise

b. Testing and experimentation

c. Fleet and in-service engineering

d. Quick reaction capability in time of emergency

e. Interface between System Commands and industry

One of the major complaints heard from the labs without unlimited authority was addressed by the Navy/Marine Corps Acquisition Review Council in 1975:

> "The most commonly voiced complaint heard throughout the R&D/Acquisition community is the widespread decoupling of accountability, responsibility, and authority. In other words, those who are accountable have insufficient authority, and those who either have authority or are in a position to influence strongly the successful prosecution of R&D/Acquisition programs (staffs) have no accountability for success or failure." [22]

A laboratory Commander has a difficult job to accomplish in a highly competitive environment. Since most laboratory work is done at the request of sponsors, successful and cost effective performance is necessary to continue to receive funding from these same sponsors. A surfeit of funds requires contracting with industry for goods and services, since personnel ceiling restrictions limit the amount of work which can be accomplished in-house. Thus, with future funds dependent upon performance, flexibility to contract in a timely manner becomes an abject necessity. A regional office, not accountable to the laboratory Commander would doubtless fail to provide the level of flexibility that an in-house contracting shop would provide. [14:9]

In 1971, the Task Group on Defense In-house Laboratories recommended that "military departments should give the laboratory directors greater control over procurement. To enable quicker reaction and responsiveness on the part of the

Defense laboratories, their directors need higher monetary thresholds and streamlined procurement procedures." Since this recommendation was made eight years ago, there is no evidence that action was taken to grant laboratories sufficient control over the contracting process. [22]

Up to this point the arguments for decentralizing R&D contracting authority have been such that most any ambitious field activity desiring an increase in authority could use them -- more responsiveness, quicker reaction capability and accountability. Setting these aside, however, the true issue can be addressed. The NRCO emphasis, as can be shown by examining the statistical summaries produced for each office, continues to be purchasing or buying. The primary customers are fleet or fleet support activities, e.g., ships, shipyards and air stations. The principal items purchased are spare parts, non-standard commercially available pieces of equipment, and routine services for base support. Negotiation Exception 11 (experimental, developmental or research work) is used very little, as are cost-type contracts. The exceptions to this generalization are the NRCO's which serve Navy labs with limited authority. Laboratory contracting is intrinsically different from volume buying. R&D is a unique process which seeks to develop the necessary technological base in order to provide the Navy with high quality weaponry in a timely manner at a reasonable cost. The labs' missions can only be accomplished through a special military-industrial technological effort involving close and continual cooperation between

engineering, contracting and industry personnel. A large portion of incoming dollars to the labs goes toward exploratory, advanced and engineering development utilizing the complete range of contract types from firm-fixed price (FFP) to cost plus fixed fee (CPFF). This very sophisticated and complex acquisition process and contracting cycle reaches its peak of efficiency when both Government and industry engineers and scientists have direct access to and continual interface with a highly trained and motivated contracting staff in close proximity. A large NRCO organization, with no accountability to the laboratory Commander, often located over 100 miles from the labs, cannot provide the effective third party essential to the success of the contractural effort. [15]

While the research found counterpoints to the traditional arguments in favor of centralized contracting authority, no counterpoints were identified as detracting from the arguments in favor of decentralization of lab authority.

3. Organizational Conflict

a. Navy Regional Contracting Office Evaluations

As addressed in the preceding paragraphs, the credibility of the responsible NRCO's evaluation of the performance of a given lab is considered questionable by laboratory personnel. As a result of a recent request for increased authority at NWC, NRCO Long Beach performed a Contract Management Review (CMR) of the NWC contracting operation. [32] As

alleged in NWC's response to the CMR findings, a professional, complete and unbiased review was not conducted. [30] NWC identified numerous instances of unsubstantiated findings. It is unfortunate that this situation occurred, however, research has shown it not all too surprising given the motivations of the organization involved.

b. Chief of Naval Material vs. Naval Supply Systems Command

As noted in Chapter II, there is a unique relationship between CNM and NAVSUP in the area of contracting policy and laboratory management. While CNM has the responsibility for the overall performance of the labs, the fact that NAVSUP, a subordinate command to CNM, controls the contracting portions provides an interesting situation. It would appear from the research that with a very vocal laboratory management clamoring for decentralization to CNM management, specific direction could be given to NAVSUP to act favorably on these requests. However, such has not been the case in the past. [4] NAVSUP's decisions have been acquiesced to by CNM.

V. RESTRICTIVE FRAMEWORK

Within the laboratory environment, the overwhelming opinion of the technical managers is that the contracting process takes too long to accomplish and is overburdened with unnecessary review requirements. To be more specific, there are three primary areas wherein significant delays occur at the expense of program progress: (1) the actual Procurement Request Preparation (PRP) process, (2) the requirement to document proposed sole source or limited source procurements over $500, and (3) the requirement for the Secretary's approval on procurements over $100,000 using negotiation Exception 11. Each of these subjects will be dealt with separately.

A. PROCUREMENT REQUEST PREPARATION PROCESS

1. Background

As with any bureaucratic organization, the Navy has established many standard procedures or rules by which operating personnel must conduct their work. The goal is uniformity, however the frustrations experienced by a field level manager when dealing with the maze of instructions, notices, directives, laws, memos and general policy statements often cause that manager to lose sight of the redeeming features of this goal. The extent of these procedural requirements can best be illustrated by examining the published procurement guidelines of a

major lab. In the section on Procurement Milestones next to the PRP portion of the contracting cycle, the time necessary is given as a question mark. [34:1-6] Some examples of the various review, approvals or determinations which must be made are:

(a) Contract Data Requirements

(b) Sole Source Statements

(c) Urgency Statement/Justification

(d) Contract Security Classification Specifications

(e) Buy American Act Exemption

(f) Automatic Data Processing Equipment Review

(g) Photographic Material

The above list, of course, does not include the preparation of the statement of work, the evaluation plan, or many other time consuming efforts. The list seems endless to many frustrated engineers who have little or no training in the contracting process, and thereby interpret it as being a hindrance to their work.

2. Current Status

The extent of reviews and procedures impacting a requiring activity or individual during the PRP phase is not likely to diminish. Therefore, in analyzing the problem, one must examine means to increase the efficiency of both the individuals and the system.

3. Problem Analysis

In any organization employing technical talent, there is some administrative effort which each technician or engineer must accomplish in order to keep the work flowing. The key decision to be made by the manager is - how much? When does the effectiveness of an engineer begin to be degraded? Pely and Andrews have concluded that within a laboratory environment, all technical personnel need to be exposed to and involved in some administrative duties. In fact, through extensive research in this area, these authors found that technical people actually benefit from mild exposure to such administrative tasks as sitting in on conferences or review committee meetings. [1:88]

In the area of training, the technical individual who is schooled in the contracting process is more apt to understand the reasons for many of the PRP reviews, and may therefore, be less likely to berate them. [21] This schooling can take many forms. Contracting for Technical Personnel is considered by attendees as an excellent course conducted on site in many locations throughout DOD. This course provides the basics of contracting in a condensed format. Another avenue to pursue for contracting knowledge is the internal guidelines many laboratories have prepared for just such personnel. A third avenue would be DOD sponsored correspondence courses in contracting. The technical manager's choices in the area of personnel efficiency are

varied, each involving a trade-off between the amount of productive time doing technical work and the amount of productive time doing administrative work.

The efficiency of the procedural or review PRP system is a function of sources both external to an organization and internal. As stated earlier, the likelihood of reductions in externally imposed restrictions is not great, in view of increased demands that the Government conduct its business fairly. That leaves laboratory managers the internally imposed restrictions to deal with.

Various labs use one of two systems to accomplish the PRP effort. First, any individual who has identified a requirement is tasked with completing all the necessary steps in the PRP cycle for that requirement. This effort may or may not involve the assistance of a contracting professional from the in-house contracting office. The benefit to this system is that this individual is most likely to be conversant with the nuances of the requirement; therefore, any question arising during the PRP cycle can be answered expeditiously. The disadvantage to this system is that the PRP processing consumes time which the engineer might otherwise spend on technically productive efforts. A second system utilized involves establishing a PRP office within each major component of the lab. As requirements are identified, this office is responsible for the PRP procedures, drawing on the engineer only as required to clarify elements in the specification.

While this system enables the engineer to devote their time to technical work, it does require billets to be sacrificed form the technical areas to staff the PRP office.

B. COMPETITION

One of the underlying reasons for the issuance of OMB Circular A-109 was the perceived need to establish a competitive environment earlier in the major systems acquisition cycle. [37] This section deals with the issue of competitive versus non-competitive contracting in the earliest phase of the acquisition cycle, Mission Area Analysis. It is during this phase that while intelligence personnel and strategists are assessing enemy threats, Government laboratories working with industry are conducting basic research and development aimed at increasing the technological base, or the limited designing of specific hardware to meet a specific need. During the research effort for this thesis, it became apparent that there is a great deal of importance of this issue to a significant number of technical personnel whose responsibilities are to expand the technological base so that future needs can be met with proven concepts. The context of this issue is limited to those contracts negotiated pursuant to Defense Acquisition Regulation (DAR) 3-211, and involving obligations of less than $100,000.

1. Background

a. What is Research and Development?

In order to provide a proper framework for the ensuing discussion, it is first necessary to establish the specific definition of Research and Development (R&D) as it will be used. The term R&D means that research effort conducted by the technical personnel in Government laboratories aimed at either furthering man's basic knowledge or applying existing knowledge to the solution of an existing or anticipated need. It also includes development effort aimed at the solution of a specific military problem. [7:104] This R&D effort may range in practical terms from the complicated research regarding optical coatings on laser windows to the development or testing of a new type of gyroscope. A key factor is that the effort is independent of a major system acquisition at this point. Another key factor is that the Government laboratories rely on industry for a major portion of this R&D effort due to both billet and talent limitations within the Department of Defense.

b. Independent R&D Contributions

DOD Directive 5100.66 establishes the policy for and the technical evaluation of Independent R&D programs conducted by industry using their own internal resources. The following passages are quoted from that directive:

> IR&D. . . is recognized by the DOD as a necessary cost of doing business in a high technology environment. Through support, consistent with the cost principles established in ASPR, of contractors' IR&D . . . programs, DOD seeks to:

- Assure creation of an environment which encourages development of innovative concepts for Defense systems and equipment which complement and broaden the spectrum of concepts developed internally to DOD.
- Develop technical competence in two or more contractors who can then respond competitively to any one requirement DOD seeks from industry.
- Contribute as appropriate to the economic stability of its contractors by allowing each contractor the technical latitude to develop a broad base of technical products. [5:5]

IR&D is recognized as a critical cog in the defense acquisition cycle. The technical breakthroughs resulting from IR&D efforts subsidized by DOD not only contribute to the technology base, but they also afford DOD the opportunity to competitively procure systems as required.

c. On the Issue of Competition

The nation's military security, as well as its broader overall economic foundations are based upon the principles of a competitive free enterprise system. Advancing the technology base efficiently, transforming this technology into end-item capabilities superior in performance and cost to those of our adversaries, is a function of these competitive forces. It has been recognized explicitly that it is conscious national policy that "DOD rely primarily on competition to select sources for developing and producing its military hardware . . ." [5:4]

Given the overall national policy that our defense contracting be based on competition, what issues complicate this policy? What factors lead to inefficiencies in the competitive contracting cycle? What factors dilute the

value of the product received as a result of the competitive contracting cycle? These and other questions shall be addressed.

One of the major complicating factors in our attempts to carry out the national policy on competition is the very nature of the R&D effort. As addressed in Chapter II, the types of firms who possess the capabilities necessary to respond to solicitations of the R&D nature this issue addresses are very limited. Specialized testing facilities, highly specialized talent in personnel, and management commitment to the pursuit of technology are all necessary prerequisites. In a study performed by the Rand Corporation for the Defense Logistics Institute, it was found that R&D is largely non-competitive. The authors further stated that, "the barriers to competition here are so severe that the prospects for significant increases in price rivalry are not encouraging." [13:12]

To this point then there seems to exist a contradiction between the spirit of the law as set forth in national policy and the realities present in the R&D environment, i.e., obtain maximum competition in an arena recognized as being highly unsusceptible to competitive forces.

2. Current Status

As part of their overall mission, Navy laboratories are responsible for either developing internally or funding industry through IR&D to develop the technological base

necessary to meet our defense needs. Once it is recognized that the in-house capability does not exist, either through billet constraints or lack of specialized talent facilities, the determination is made to rely on industry. As used in this context, industry includes not only the normal profit motivated firm, but also the non-profit research centers such as those associated with some of the major universities in the U. S.

Working closely with contracting personnel, the engineers first develop a meaningful statement of work within which the contractor must perform. Due to the often ambiguous nature of the research effort, this process can take weeks in view of the numerous commitments the technical people face. [21]

It is at this point that a major dilemma appears; a dilemma resulting from one of two possible sources. First, the technical effort contemplated could very well be the result of an unsolicited proposal from industry, or if it is an in-house idea, the technical community could desire a sole-source contract even though another firm may have the minimum capabilities to perform.

Unsolicited proposals as defined in DAR 4-900 are the product of original thinking, are submitted by industry without prior solicitation from the Government, and in order to be contracted for, must be shown conclusively to be available from no other source. While in many cases it is not difficult to substantiate the third requirement, for instance due to

highly specialized testing facilities required, in many other cases the effort could be performed by two or more firms. The engineer responsible for the project must, according to DAR, substantiate the sole-source nature in order for the Contracting Officer to make the sole-source determination required. The IR&D effort described earlier is the major source of unsolicited proposals. Highly concentrated defense firms are continually developing potential military applications for concepts or technology they achieve through independent research.

The second source of this dilemma is a product of another key responsibility of the technical personnel in laboratories. During many conversations with project supervisors and working engineers, it was learned that they spend a great deal of time reviewing hundreds of technical periodicals or other literature in order to stay abreast of new developments. As a result of this review process, many engineers have very strong opinions regarding the "leaders" in industry - who is doing what, who is the most advanced, who has made certain breakthroughs? Consequently, when a requirement is identified, in order to preserve the integrity of the concept, the engineer desires that the most competent firm be awarded the contract, not just the lowest priced firm among all who meet the minimum requirements.

In order to resolve the problem at this stage, a popular, if not the only solution, is to develop a fair set of evaluation criteria to be used in reviewing the responses to

the solicitation released to industry. Since the major goal of the proposed effort is to prove a technological concept or principle, nearly all of these evaluation systems are designed with cost as being of negligible importance, while the technical capabilities demonstrated or offered by the firms are of paramount importance.

According to informal standards recognized by one major Navy laboratory, this evaluation process takes an average of two man-weeks. The time spent on the actual evaluation is in the neighborhood of 20-30 hours; however, again many other commitments prevent full-time attention to the evaluation. Upon completion of this technical evaluation, the proposals and their respective technical scores are forwarded to the Contracting Officer for review.

Research has shown that due to the highly technical nature of these types of procurements, nearly all of them are suitable for only Cost Plus Fixed Fee (CPFF) contracts. The uncertainties are great, the specification or statement of work is not well defined, and the contractors are unwilling to accept the risk associated with any other contract type. Consequently, once the Contracting Officer has identified those firms in the competitive range, there is very little analysis necessary to establish the reasonableness of the proposed cost. Typically, the numbers of labor hours proposed by the contractor(s) are reviewed by the engineer, the labor and overhead rates proposed by the contractor(s) are verified with the Defense Contract Audit Agency (DCAA),

and the Weighted Guidelines or other technique is used to determine an appropriate fee amount. Negotiations are generally limited to the fee area, and contract award is made. It should be noted that if the proposed contractor is a non-profit educational institution, no fee is paid.

During the term of these types of contracts, the contractor is reimbursed for all costs that are determined to be allowable and allocable. Upon completion of the specified effort, the fixed fee is paid where applicable, with the Government receiving the results required by the statement of work.

3. Problem Analysis

At this point, one might ask how this apparently smooth functioning process could be improved. When examined in detail, the answers may become clearer. For purposes of this analysis, assume that the restrictions on sole-source contracting were lifted entirely on procurements such as these. What benefits would accrue to the Government, and what disadvantages would appear?

a. Benefits

Fox recognized four factors which make such non-competitive or single source procurements more desirable than competitive procurements. [7:256]

First, the most valuable resource (and the most costly to the taxpayer) which the laboratories possess is the personnel with their talents and high level of experience.

Outside of the Washington, D. C. area, it is recognized that the various R&D laboratories are staffed with some of the most competent individuals in Government circles. This situation is attested to by the number of personnel who transfer between the labs and the major commands in Washington. To place demands upon the time of these personnel in light of limited benefits is not cost-effective. To process a competitive procurement requires more time on the part of the technical personnel, to ensure that work statements are written carefully and can be interpreted equally by all interested firms. Once the proposals are received, the previously mentioned evaluation process must be undertaken to examine the particular strengths and weaknesses of each offeror in order to determine the best qualified, all factors considered.

Second, Fox contends that competitive contracting increases the likelihood of protests and disputes from disgruntled contractors. In view of this possibility, contracting personnel interviewed agree that extra care must be taken by all personnel involved in the competitive procurement process to ensure that fairness is established and maintained. Inquiries from Congress of other contractors must be responded to with fully supportable information regarding decisions made.

Third, the relationship built up between Government and industry technical personnel can become strained in the face of competitive contracting. As addressed earlier,

Government technical personnel are continually in contact with industry counterparts, discussing the technical progress enjoyed. By forcing competition, the system tends to break down these relationships, thereby possibly leading to a reluctance for industry personnel to discuss or transmit technical information which could be of value.

The final point made by Fox does not have a great deal of bearing on the specific R&D contracts being addressed here; however, there is some applicability. He contends that the competitive process involves an evaluation of the offerors, often leading to an award to the low-cost contractor. Problems of quality and reliability can then surface, requiring the buying organization to explain them to higher authority. During the evaluation of offers in an R&D program, subjective judgements are being made. If an erroneous judgement results in a less than qualified contractor being selected for research in an important area, the ramifications can be long delays, wasted money, or an inadequate product.

Fox's first point must be expanded somewhat in view of recent directives from the Chief of Naval Material (CNM). Recently, CNM has issued a series of instructions on the topic of Contractor Support Services. The impetus behind these instructions was a lack of control of both the contracting process and the contractor's performance on these types of procurements. A common problem as characterized by CNM was a lack of sufficient monitoring of the contractor's performance to ensure that the Government was receiving a

fair return on its investment. Many of these contracts were multi-million dollar, requiring non-personal services to be performed either on or off Government property. Inherent in any solution to the problems addressed was the need for more man-hours to be devoted to contractor surveillance, contract review and technical evaluation. By reducing the amount of time taken up by low dollar R&D procurements, more engineer and Contracting Officer time could be devoted to these high-impact, high-cost contracts.

Another advantage seen by laboratory technical and contracting personnel in a relaxation of the restrictions on single-source procurements is the possible increase in the number of unsolicited proposals from industry resulting from IR&D effort. If industry were to be assured that all technically valid proposals could be processed quickly without the limitations now present to justify sole-source, they may feel more open in submitting such proposals. Billet drawdowns as experienced and proposed recently within DOD will require a greater reliance on industry. Any reasonable changes which would encourage industry to actively pursue technology advancement would compensate in some measure for the reductions in Government capabilities.

With regard to the Contracting Officer's involvement in this process, two improvements are seen in a relaxation of the single-source documentation requirements or the competitive selection process requirements. As indicated earlier, the time necessary for all competing offerors to

evaluate and respond to a solicitation is agreed to be about 30 days, except under legitimate cases of urgency. It is doubtful if the highly-qualified, expert-in-the-field contractor would require as much time. In fact, most sole-source contractors in R&D have no trouble responding to solicitations within 15 days, based upon the researcher's observations. This time savings, coupled with the elimination of the file documentation requirements, would enable the laboratory contracting organization to increase their overall efficiency.

b. Drawbacks

The foremost drawback to such a revision to policy on single-source contracting is the possibility of favoritism that may develop between certain Government personnel and contractors. If restrictions were lifted, eliminating the need for documented single-source decisions, charges could be levied that other fully capable contractors would be precluded from demonstrating their own expertise. In order to eliminate this fear, the integrity and professional competence of the Government engineers and contracting personnel must be relied upon. As a further precaution, Government contracting personnel would have to continue their close scrutiny of work statements and actual contractual results. The researcher's experience has been that laboratory personnel are thoroughly professional with very few exceptions. It is an unpleasant observation that with or without restrictions in any system there will be a select few who choose to place

personal gain or program completion over the integrity of the system as a whole.

If one is to accept the generally understood belief that competition reduces procurement expenditures by approximately 25%, [7:256] then one might assume that relaxing non-competitive restrictions would lead to higher costs in the R&D arena. The researcher believes this would not be the case. Given that nearly all of these contracts are CPFF, that the most technically competent firms would be chosen and that their reputation within DOD would be on the line, so to speak, [12:7] the final costs and fee paid would be within close proximity to those paid to a competitively chosen firm. In fact, they may be lower due to possible efficiencies possessed by the industry leaders.

C. SECRETARIAL DETERMINATIONS AND FINDINGS

1. Background

All procurement within DOD must be accomplished by Formal Advertising (FA) unless the circumstances of the procurement justify the use of one of the seventeen exceptions permitting negotiation. These exceptions are clearly defined in 10 U. S. C. 2304(a). Exception (11), Experimental, developmental, or research work is used quite commonly within the laboratory community, as one might expect. As addressed previously, the number of highly qualified contractors available for R&D work is generally limited due to the unique skills

and facilities required. Additionally, costs are much less definable at the inception, leading in most cases to a cost reimbursement contract. Since cost contracts are precluded under FA, R&D work must be negotiated. [2:108]

For many of the seventeen exceptions, including (11), the contracting officer must make a Determination and Findings (D&F) in writing that the work to be performed is not appropriate for FA. Additionally, several of the exceptions (11) through (16) require the Secretary's approval on the D&F prior to solicitation.

2. Current Status

Prior to passage of Public Law 87-653 in 1962, the requirement for a Secretarial D&F when contemplating the use of Exception (11) for R&D had no monetary limitations. All actions involving Exception (11) had to be processed through the Secretary. However, due to the growing use of R&D within DOD, PL87-653 established a threshold of $100,000, below which the Secretary's approval was not required. [2:109] While this change provided some relief to both field level personnel and personnel in the Secretary's office, continued use of Exception (11) has amplified the administrative burden.

3. Problem Analysis

A review by the researcher of the awards made during FY 79 by the labs, or NRCO's supporting the labs, shows a

substantial number of Exception (11) D&F's required. In fact, one individual contacted in the Secretary's office devotes the majority of his time to reviewing D&F's. The administrative lead time necessary for the forwarding of the D&F from the contracting officer to the Secretary, via CNM, adds a delay to the overall processing of these contracts as evidenced by one NRCO's contracting milestone chart indicating that seven to sixty days should be allowed for this purpose. Discussions with field personnel indicated that sixty days may be the average time. In fact, one instance was cited wherein the delay was five months - allegedly due to the approving official's reluctance to sign until confirmed in his new position. [15]

The Commission on Government Procurement recommended that this requirement for a Secretarial D&F be eliminated.

> "We did not find a single instance where a D&F with respect to R&D was disapproved because use of negotiation was not considered appropriate. The present statutory requirement to justify the use of negotiation results in many unnecessary and perfunctory exercises." [38:25]

Senate Bill S.5 eliminates this requirement as a result of the Commission's recommendation. [40]

One method the field level personnel have used when available to expedite the process is to forward the D&F for approval at the the time the requirement is initially identified. While the D&F is cycled through the administrative chain, the balance of the PRP process is undertaken. In this manner, lost time is kept to a minimum. It is an unfortunate

reflection on the system however, when methods must be devised to circumvent or allow for delays imposed without redeeming benefit.

VI. CONTRACT MANAGEMENT

This issue addresses the general subject of services contract management by examining the requirements for such activity by engineering personnel, the reactions of technical managers to these requirements, and an analysis of both the merits of the requirements and the legitimacy of the technical personnel's reactions.

A. BACKGROUND

In recent years, various surveys have been conducted which have uniformally determined that the extent and quality of monitoring contractors performing under service contracts have been deficient. [27] Many of these contracts were of the WAC variety as discussed in Chapter III. The particular deficiencies noted have included, (1) lack of familiarization by technical personnel regarding their duties, (2) insufficient time devoted to ensure that contractors are employing efficient methods, (3) lack of attention during the invoicing process to ensure that fair value was received for payments made, and (4) blatant disregard for established procedures often resulting in indictments and criminal convictions. [17] In response to a perceived need, NAVSUP issued NAVSUPINST 4330.6 on 29 December 1977. This instruction set forth specific procedures to be used in the management of services

contracts wherein task orders (TO), Work Assignments (WA) or Delivery Orders (DO) are issued by requiring activity personnel as delegated by the Procuring Contracting Officer (PCO).

The specific action paragraphs included in this instruction address:

- The qualifications of the ordering officer appointed by the PCO.
- The contents of WA's/TO's/DO's issued.
- The specific duties of an ordering officer.
- The specific duties of the Contracting Officer's Technical Representative (COTR).
- Controls by PCO governing the ordering process.

Appendix D lists the duties assigned to the technical representative within the requiring activity. A cursory perusal of these duties would lead one to conclude that the monitoring of a service contract within the R&D arena would prove to be a full time responsibility, and in fact, the general reaction of the technical community upon issuance of this instruction was predictably vocal. In addition to complaints regarding the duties themselves, the requirement for each prospective COTR to attend a training or indoctrination seminar was the subject of strong objection.

B. CURRENT STATUS

During the interview portion of this research, it was learned that much of the initial negative reaction to the

requirements of the NAVSUP instruction has waned. Closer examination of the duties, with concurrent examination of the work already being performed by requiring activity technical personnel, have resulted in many engineers concluding that the instruction's requirements are more palatable. There still exists, however, a pervasive feeling among technical managers that their responsibilities as COTR's in the area of contract management are too great, that the contracting hierarchy is not attuned to their sensitivities, and that they were not hired or trained to be contract administrators.

C. PROBLEM ANALYSIS

The Navy R&D community is not unique in its being cast as ineffective in performance of COTR duties. The Army Audit Agency has also found widespread deficiencies in how the Army's COR's perform. The Army's findings go on to say that there are no U. S. Army policies concerning the selection, use, orientation and training of Army personnel monitoring service contract perfromance. [6:9] While Domasinsky concluded that the DAR guidance on service contract administration was profoundly deficient [6:40], the Navy, with the issuance of NAVSUPINST 4330.6 has established guidance. The question now becomes - is the instruction too explicit? Does it allow the requisite flexibility for the PCO to properly

determine the amount of authority to be delegated to a COTR? The general opinion of the senior managers within the lab community is that too much has been specified, that controls have been levied on the process which hinder the effective use of WAC's. [3]

In those laboratories staffed with a professional contracting office, including GS-12 level contract specialists performing the ordering function on WAC's, the researcher believes that the NAVSUP instruction does limit the requiring activity's flexibility by requiring a PCO review of all proposed WA's over $50,000. An alternative general form of guidance could have been provided to the PCO's, tasking them with instituting whatever controls are needed to ensure that requiring activities ordering officers and COTR's discharge their duties in a responsible manner.

In response to those technical personnel who persist in their belief that the COTR duties are too all-encompassing - that their responsibilities in the area of contract management are outside the proper scope of their work assignments, one must examine the record. Of the indictments brought in recent months in the area of improper use of contractors, not one individual has been in a contracting office. [18] Users, requiring activity technical personnel and other individuals in the ordering, and receiving portions of the cycle have been cited. Additionally, as both the Navy Audit Service and Army Audit service conclude, the technical community is not discharging its responsibilities in a professional manner.

VII. CONCLUSIONS/RECOMMENDATIONS

A. CONTRACT FORMAT

1. Conclusion

There presently exists no suitable authorized contract type for the successful accomplishment of the R&D mission as pursued by the CNM labs. Research has shown that the use of BOA's is inappropriate due to the requirement that each new work package must be treated administratively as a new procurement; thus, breaking the desired continuity of an R&D program. Obtaining one-time deviations from DAR for each proposed new contract is also administratively burdensome. The research has shown that the Work Assignment Contract is uniquely suited to the R&D arena in view of its inherent flexibility.

2. Recommendation

The Chief of Naval Material (CNM) should take the appropriate steps for the establishment of a new contract type in DAR - the Work Assignment Contract, to be authorized exclusively in the R&D arena. Without such a contract vehicle, the R&D contracting process will be ineffective in meeting the traditional objectives of a typical R&D program. CNM should enlist the support of the Navy's DAR council

representative, other service representation, and the Under Secretary of Defense for Research and Engineering (Acquisition Policy) in implementing this recommendation.

B. CONTRACTING AUTHORITY

1. Conclusion

The specific missions and responsibilities of the labs are not accounted for during the NAVSUP decision process regarding contracting authority. Research has shown that using the standard algorithm does not recognize the unique requirements of the labs, and that the traditional arguments in favor of centralized contracting are of questionable merit. Costs are not necessarily increased, trained personnel can be acquired, and consistent policy flow can be present with decentralized contracting authority in the CNM labs.

2. Recommendation

NAVSUP should examine the R&D contracting needs more closely during its contracting authority decision process. The need for responsive, accountable support in laboratory contracting should be included as a subjective determination of contracting authority, rather than a rigid adherance to the principles of centralization. NAVSUP should work closely with the CNM technical community in reviewing the requirements and capabilities of the labs in order to reach a more meaningful decision.

3. Conclusion

The organizational conflict between CNM and NAVSUP leads to a perceived lack of CNM support in conjuction with field level contracting authority issues. Laboratory managers sense a failure by CNM to articulate the labs' needs when a question of contracting authority is raised. Research shows that this perception is not without foundation, since authority increases are not supported strongly by CNM.

4. Recommendation

CNM should establish a firm policy on the contracting authority requirements of the labs, and articulate that policy to NAVSUP for consideration when reviewing authority requests. Only in this manner will NAVSUP have clear directions from CNM. In addition, specific requests routed through CNM should be reinforced by CNM with a substantial endorsement.

5. Conclusion

Utilizing the responsible NRCO to evaluate a lab's effectiveness during the contracting authority decision process is inappropriate in view of the NRCO's vested interests. With its own survival in the balance, evidence shows that the regional office is not totally objective in its evaluations, therefore, the evaluation loses its effectiveness as a tool used during the decision process.

6. Recommendation

Contract Management Reviews conducted incidental to contracting authority increase requests should be performed by NAVSUP or the Inspector General. This is necessary to ensure the objectivity essential to such a critical decision.

C. RESTRICTING FRAMEWORK

1. Conclusion

Laboratory managers have seen the effectiveness of their technical personnel assets erode as the result of their involvement in the Procurement Request Preparation (PRP) process. This is characterized by the labs experiencing an increasing number of technical personnel devoted to the PRP process, vice actual bench work. Additionally, the overall contracting knowledge level of technical personnel was found to be deficient, thus leading to inefficiency in that time spent on the PRP process.

2. Recommendation

Recognizing that the quality of a contract flows logically from the quality of the procurement request, lab managers must each reassess their own organizations to determine how best to comply with the myriad of requirements in the PRP process. Additionally, in formulating an organizational component with PRP responsibility, the lab manager

must recognize the importance of training in the contract area. Research evidence shows that highly trained, dedicated personnel can serve as a positive force in reducing the amount of time spent during the PRP process.

3. Conclusion

The restrictions on sole-source negotiated (Exception 11) procurements are of questionable benefit. Research shows that the unique nature of R&D requirements and the industrial base supplying them do not lend themselves to competitive contracting. In fact, fewer than one-quarter of such requirements under $100,000 were processed competitively during FY 79.

4. Recommendation

The requirement to extensively document a non-competitive R&D procurement under $100,000 should be eliminated. These requirements and the R&D industry are not generally suited to competition, and the documenting of sole-source is a troublesome administrative burden. Lifting the requirement will allow a much smoother flow of the requirements and reduce the administrative burden on both the requiring activity and the Contracting Officer. CNM should work with the DAR Council and the Office of Federal Procurement Policy to obtain a revision to Senate Bill S.5 to include this recommendation. The researcher must caution contracting personnel to be diligent in detecting split requirements should this recommendation be implemented.

5. Conclusion

The present requirement for Secretarial Determination and Findings (D&F) approved on R&D contracts over $100,000 is ineffective and administratively burdensome. Evidence from research shows that not one D&F has ever been disapproved because negotiation was inappropriate, and the the process of approval takes an average of over sixty days.

6. Recommendation

CNM should work with the other services and the Office of Federal Procurement Policy to obtain passage of Senate Bill S.5, which eliminates the Secretarial D&F requirement. Removal of the requirement will not degrade the quality of the procurements, and it will lead to a more responsive contracting cycle. Until such time as Senate Bill S.5 is passed, CNM should work with the Secretary's Office to ensure that inefficiency in the approval process is eliminated to reduce administrative lead time.

D. CONTRACT MANAGEMENT

1. Conclusion

Laboratory technical personnel and senior managers do not appreciate the breadth and depth of their responsibilities in the area of contract management. Consequently, an ineffective level of performance pervades the administration

of R&D services contracts. Naval Audit Service reviews and Naval Supply Systems Command reviews have substantiated this during recent field level examinations of the contract administration function.

2. Recommendation

CNM should strongly emphasize to senior laboratory managers that their responsibilities as acquisition team members are extensive. Effective technical involvement as Contracting Officer's Technical Representatives (COTR's) is imperative if contracts issued are to be properly administered. The CNM contracting organization (08C) should delineate to the technical managers the provisions of all pertinent instructions and guidance. Additionally, MAT 08 should hold laboratory managers accountable for the proper performance of these duties during annual reviews of the labs' effectiveness.

3. Conclusion

The NAVSUP instruction regarding the administration of services contracts is too specific to permit effective field implementation at the labs, and is too restrictive in its setting of controls on the process. Specifically, the presence of experienced GS-1102 contracting personnel at the labs is not recognized, leading to controls which are aimed at lesser staffed organizations. Additionally, the specific steps in processing a Task Order or Work Assignment are

delineated, giving neither the contracting officer nor the requiring activity any degree of meaningful flexibility.

4. Recommendation

NAVSUP should revise NAVSUPINST 4330.6 to allow more discretion by the Procuring Contracting Officer (PCO) in determining the controls and procedures necessary for individual requiring activities. This would reward professionally competent contracting officers with fewer controls, while enabling the PCO to retain control over those offices not operating as effectively. Additionally, the practice of issuing an all-encompassing instruction to control a process within which a limited number of infractions have occurred should also be re-examined by NAVSUP. Well managed contracting activities should not be needlessly stifled in their operations.

E. CONTRIBUTION OF RESEARCH EFFORT

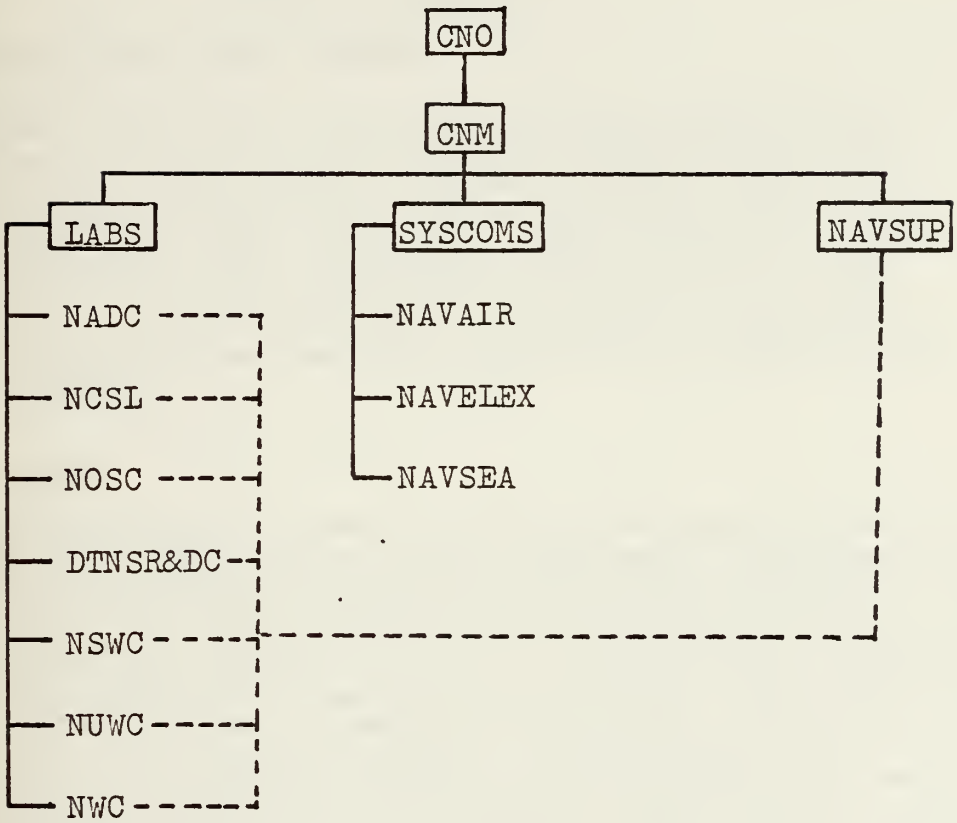
The researcher believes that this study has exposed some serious deficiencies in the policy and procedural aspects of R&D contracting within the CNM laboratory arena. It is incumbent upon both field level and headquarters level personnel to more fully understand the nature of R&D contracting. Only in this manner can meaningful progress be made towards more effective contracting.

F. AREAS OF FURTHER STUDY

Further study is recommended in the areas of, (1) Navy Industrial Fund (NIF) funding in the contracting for services in the lab community, (2) precise model development for determining resource requirements in the contract management area, and (3) the organizational anomalies applying to CNM and NAVSUP.

APPENDIX A

PRESENT LABORATORY STRUCTURE



———Denotes line authority

------Denotes contracting authority

APPENDIX B

(Excerpted from Contract N00123-79-C-0051)

PART II - THE SCHEDULE

SECTION B - SUPPLIES/SERVICES & PRICES

SCOPE: The contractor shall provide labor, materials and facilities as may be required to develop advanced technology for the ATD/LASER Gyro Program. The advanced technology effort shall include the technology required for laser gyro product quality control, development of low-cost design variants to minimize cost and maximize yield, such as Internal Metal Dither Springs (IMDS), Improved Path Length Control (IPLC), mirror polishing and inspection, investment casting of selected piece parts and remote electronics. The producibility of this low-cost design shall be demonstrated and compared to projected target costs. This effort will be pursued in accordance with Section F herein and in accordance with individual work assignments as may be issued hereunder.

LEVEL OF EFFORT

a. It is understood and agreed that while the contractor's performance during the period from 2 October 1978 to 2 October 1980 hereunder is based upon an anticipated level of effort consisting of 83,718 manhours of direct labor including subcontracts and interdivisional labor but excluding holidays and vacation, shift differentials and overtime premiums, such level of effort may fluctuate in pursuit of the assigned technical objectives. In the event that the number of manhours of direct labor expended or to be expended in the performance hereof exceeds 110% of the established level of effort the contract shall be amended to provide for a revised level of effort and an equitable adjustment of the estimated cost and fixed fee. Any such upward adjustment of the fixed fee shall be prospective only and shall be based solely upon that part of the revised level of effort which is in excess of 110% of the original level of effort, or, if said level of effort has been previously revised, upon the additional level of effort which is in excess of 10% of the fee-bearing portion of the additional hours by which the level of effort was last increased, and shall be based upon the application of appropriate cost factors adjusted to the then current conditions. Notification shall be furnished to the Government in writing whenever 85% of the established level of effort is reached.

b. In the event that less than 90% of the original level of effort, or, (if said level of effort has been previously revised upward) of the fee-bearing portion of the additional hours by which the level of effort was last increased, is actually expended by the expiration date of the contract, the Government shall have the option (i) of requiring the contractor to continue performance (not to exceed 30 days however) until the effort expended equals 90% of the original level of effort or of the fee-bearing portion of the last upward revision, and/or (ii) of effecting a reduction in the fixed fee by the percentage by which the total of expended manhours is less than 90% of the original level of effort or of the fee-bearing portion of the last upward revision.

SECTION F - DESCRIPTION AND SPECIFICATIONS

DESCRIPTION AND SPECIFICATIONS

The work under this contract shall be performed in accordance with the following requirements and in accordance with any other terms, conditions and requirements as may be reflected herein:

Develop advanced technology for the missile-grade laser gyro. This includes the technology required for laser gryo product assurance, development of low-cost design variants, and a demonstration of missile-grade laser gyro producibility. Using the Honeywell GG-1328AA laser gyro as a design baseline, develop a low-cost gryo design and demonstrate the producibility of this design. The performance targets for the low-cost GG-1328 gryo shall be as defined in Table I.

Table I. Missile-Grade Gyro Targets.

Gyro Parameter	Targets
Projected cost, average for first 6000 production units, FY 77 dollars	$2350 each or leas
Predicted reliability	15,000 hours mtbf or greater
Maintainability	No scheduled recalibration
Performance	Honeywell Specification DS 25525-01

Provide material and services necessary to accomplish the following:

a. Specific Analyses and Technical Studies to support reduction in the cost of the GG-1328 Ring Laser Gyro.

b. Fabrication, assembly, and test and evaluation of components, piece parts, and circuits used in the GG-1328 Ring Laser Gyros.

c. Fabrication, assembly, and test of GG-1328 Ring Laser Gyros incorporating cost-reducing design innovations.

d. Analysis, test and evaluation, failure analysis and corrective action studies, and analytical projection of the life and reliability of the GG-1328 Ring Laser Gyro.

e. Performance and acceptance tests.

Deliver to NWC the following hardware items (target):

a. Two (2) refurbished GG-1328AB Laser Gyros (interim low-cost design hardware).

b. Six (6) prototype low-cost gyros (design proof hardware).

c. Twenty (20) producibility gyros (cost, producibility, and reliability demonstration hardware).

WORK ASSIGNMENT
11ND-NWC-4330/33 (REV 4-78)

NAVAL WEAPONS CENTER
CHINA LAKE, CALIFORNIA 93555

PAGE OF

TO	CONTRACT NO.	WORK ASSIGN. NO.	REVISION NO.
Honeywell Avionics Division	N00123-79-C-0051	1002	

SUBJECT

LGTA Prototype Development

DISTRIBUTION	EFFECTIVE DATE	COMPLETION DATE
	1 Oct 1978	30 Sept 1979

Honeywell (3)
DCASPRO, Honeywell
DCASR, St Louis
314
3141
2521
25.75
0862
2402

SUMMARY ESTIMATE

ITEM	LABOR	COST
Engineering		405,833
Material		10,834
Fee		33,333
TOTAL		450,000

	SIGNATURES	DATE
ENGR CONTR		
M. Demos		11/14/78
ENGR NWC		
R. L. Beyer		9/28/78
MGR CONTR		
A. R. Berg		11-14-78
MGR GOVT		
G. R. Lowham		28Sep78
NACA NWC		
R. C. Hill		12/15/78

REMARKS

This work assignment is funded by and subject to all the terms and conditions of the basic contract. In no event may cumulative expenditures under this and all other Work Assignments exceed the amount allotted to the basic contract for cost purposes without a formal written modification to the contract.

The total summary cost estimate for this Work Assignment (including all revisions issued to date) is $ 416,667 plus an estimated fixed fee of $ 33,333 for a total summary cost estimate and estimated fixed fee of $ 450,000

Notwithstanding the total summary cost estimate and estimated fixed fee for this Work Assignment indicated herein, only the amounts shown below are currently allotted for performance.

COST	FIXED FEE	TOTAL
$ 122,325	$ 10,637	$ 132,962

The limitation of funds clause, DAR 7-203.3 (1966 Oct), applies to this Work Assignment in the same manner as it applies to the basic contract.

Title: LGTA Prototype Development Work Assignment 1002 in the Advanced Technology Demonstration Program

Ref: (a) Navy Contract N00123-78-C-0153
(b) Navy Contract N00123-79-C-0051
(c) Navy Contract N00123-76-C-1208

STATEMENT OF WORK

Provide materials and services to design, develop, and test Low Cost GG-1328 gyros to be used in the Laser Gyro Triad Assembly (LGTA) prototype under consideration. Extend the configuration study pursued under reference (a) to include Supersonic Tactical Missile (STM) space allocation considerations. Pursue the prototype triad and electronics design commensurate with this work assignment. This work shall be performed within the scope and intent of reference (b).

2.3.2.1 LGTA Configuration

Extend the configuration and interface study performed under reference (a) to include the packaging and compatibility requirements for the Supersonic Tactical Missile (STM) of the LGTA. Conceptual design shall include LGTA and digital computer systems space as well as STM/LGTA dynamic environmental requirements. Include the results in a technical report and submit to NAVWPNCEN.

2.3.2.2 Design Low Cost Gyro Blocks and Gyro

Design the GG-1328, C101, equilateral, IMDS block. New features to be considered in the design will be an extended range Path Length Control (PLC), Block Mounted Readout (BMRO), indium pressure seals for the electrodes and "soft" seals for the mirrors and the use of a retractable getter. The task is essentially to complete the work initiated under Work Assignment Task 5.3.1 of Contract N00123-76-C-1208. Update the existing drawings of the GG1328 laser block to an IMDS/C101 configuration. Coordinate the design with production to assure all currently available producibility features are included, as well as all internal development results from the laser cavity design group. Conduct a structural analysis of the laser block/suspension system and gyro electronics to assure satisfactory performance in the anticipated environment as specified in Reg. Memo 3141-109-78. Conduct a thermal analysis of the laser block/suspension system and electronics to establish temperature rise and distribution. Submit structural and thermal analysis reports to NAVWPNCEN for information.

2.3.2.3 Fabricate LC Prototype Blocks

Fabricate four (4) blocks incorporating the new design features determined mutually between the NAVWPNCEN and Honeywell Inc. to be practicable within the time and funding constraints utilizing low cost producibility techniques and processes available. Fabrication shall be in accordance with the approved Honeywell QA procedures 3-1-4 (ICS) submitted under reference (c) and the Configuration Item Plan approved by the NAVWPNCEN prior to build.

2.3.2.4 Test LC Prototype Gyros

Prepare a test plan and submit to the NAVWPNCEN for approval. Testing may be accomplished using an appropriate test fixture until the LC configuration is available. Testing shall include ATP, thermal sensitivity, Input Axis (IA) stability. Environmental testing will include vibration, linear acceleration, shock, room and extended temperatures. These tests shall encompass the above tests as well as any detailed tests felt to be necessary as a result of incorporation of new low cost features. Deliver test results to the NAVWPNCEN.

2.3.2.5 LC Gyro Electronics Design/Packaging

This task will be a continuation of work performed under Work Assignment Task 5.3.1 of Contract N00123-76-C-1208. Review and update the existing electronics specification, perform electronics partitioning to satisfy packaging, layout, and environmental provisions of new improvement features. The design shall comply with soldering specification WS6536 with deviations required by the product and approved by the NAVWPNCEN. Initiate the physical and electrical design of the present electronics to incorporate the following features:

(a) New, cost effective circuits such as the Pseudo Random Noise Generator (PNG), Electronic Controlled Dither (ECD), and others determined to be appropriate by the NAVWPNCEN and Honeywell Inc.

(c) Physical and electrical compatibility with the Laser Gyro Triad Assembly configuration.

(d) Commonality of electronics, wherever practicable to reduce parts count and maximize producibility.

Salient features of the design shall include:

(a) Low cost assembly techniques, where applicable.

(b) Low cost fabrication, where applicable.

(c) Ease of access and repair.

(d) Packaging in conformance with the LGTA configuration.

2.3.2.7 LGTA Mount Design

Initiate the development of the laser gyro triad assembly mount compatible with the selected configuration. Develop the design criteria for LGTA applications, generate layout drawings/designs of the triad assembly, and deliver to the NAVWPNCEN for information. Initiate design analysis to determine critical design features such as LGTA tradeoffs on acceptable coning levels; structural and thermal analysis of weight versus required mount stiffness and thermal gradient effects. Included in this design will be space and alignment provisions for the three accelerometer package and associated electronics.

2.3.3 Concept Review

Conduct a concept review at Honeywell Inc., Minneapolis facilities in accordance with WA 1001 to present the LGTA concept proposed and to review the progress and problems incurred during the laser block fabrication and assembly. This review will be used to identify and prioritize tasks remaining for the development of a prototype LGTA.

ATCH NR _____ TO EXHIBIT A to WA#1002

TO CONTRACT/PR N00123-79-C-0051

CONTRACT DATA REQUIREMENTS LIST

CATEGORY NA

SYSTEM/ITEM LGTA PROTOTYPE

CONTRACTOR HONEYWELL

1. SEQUENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA / 3. SUBTITLE	4. AUTHORITY (Data Item Number)	5. CONTRACT REFERENCE	6. TECHNICAL OFFICE	7. DD250 REQ	8. APP CODE	9. INPUT TO IAC	10. FREQUENCY	11. AS OF DATE	12. DATE OF 1ST SUBMISSION	13. DATE OF SUBSEQUENT SUBM EVENT ID	14. DISTRIBUTION AND ADDRESSEE (Addressee – Regular Copies Repro Copies)	
A005	TECHNICAL REPORT (Configuration and Interface Study)	DD Form 1664 DI-S-1800	Para 2.3.2.1 of WA#1002	NWC Code 3141	LT			OTIME		See Blk 16		NWC 3141	2/0
												TOTAL	2/0
A006	TECHNICAL REPORT (Structural Analysis)	DD Form 1664 DI-S-1800	Para 2.3.2.2 of WA#1002	NWC Code 3141	LT			OTIME		See Blk 16		NWC 3141	2/0
												TOTAL	2/0

16. REMARKS

Blk 12: Submit Technical Report NLT 15 DA completion of Configuration and Interface Study effort.

Tailor DID (DI-S-1800) as follows: Delete the entries in Blks 6 & 9. Delete paras 10.1 and 10.2 of Blk 10. Para 10.3 is applicable. The report shall include the packaging and compatibility requirements for the Supersonic Tactical Misslie (STM) of the LGTA.

This is an extension of the Configuration Study pursued under Contract N00123-78-C-0153.

16. REMARKS

Blk 12: Submit Structural Analysis NLT 15 DA completion of effort.

Tailor DID (DI-S-1800) as follows: Delete the entries in Blks 6 & 9. Delete paras 10.1 and 10.2 of Blk 10. Para 10.3 is applicable. The report shall document the results of the analysis to assume satisfactory performance in the anticipated environment as specified in Reg. Memo 3141-109-78. Contractor's format is authorized.

PREPARED BY	DATE	APPROVED BY	DATE
Naval Weapons Center (Code 3651) China Lake, CA	20 Sep 78	Dwight L. Anderson, Chairman, NWC Data Requirements Review Board	27 SEP 78

DD FORM 1423 S/N 0102-014-1503 REPLACES ADITION OF 1 APR 80, WHICH IS OBSOLETE

PAGE 1 OF 4 PAGES

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ATCH NR _____ TO EXHIBIT A to WA#1002
TO CONTRACT/PR N00123-79-C-0051

CONTRACT DATA REQUIREMENTS LIST
CATEGORY NA

SYSTEM/ITEM LGTA PROTOTYPE
CONTRACTOR HONEYWELL

1. SEQUENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA / 3. SUBTITLE	6. TECHNICAL OFFICE	10. FREQUENCY	12. DATE OF 1ST SUBMISSION	14. DISTRIBUTION AND ADDRESSEES (Addressee – Regular Copies; Repro Copies)
	4. AUTHORITY (Data Item Number) / 5. CONTRACT REFERENCE	7. DD250 REQ / 8. APP CODE (A) / 9. INPUT TO IAC (E)	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBM/EVENT (D)	
A009	DRAWINGS, ENGINEERING & ASSOCIATED LISTS Level 2 (LC Gyro Electronics) (Update)	NWC Code 3141	See Blk 16	See Blk 16	See Blk 16
DD Form 1664 DI-E-7031	Para 2.3.2.5 of WA#1002	DD		See Blk 16	

16. REMARKS

Reference Blk 10, Para 10.2 of DI-E-7031. Ordering data required by para 6.2 of DOD-D-1000B and submittal instructions are provided by the attached supplement.

15. TOTAL See Blk 16

1. SEQUENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA / 3. SUBTITLE	6. TECHNICAL OFFICE	10. FREQUENCY	12. DATE OF 1ST SUBMISSION	14. DISTRIBUTION AND ADDRESSEES (Addressee – Regular Copies; Repro Copies)
	4. AUTHORITY (Data Item Number) / 5. CONTRACT REFERENCE	7. DD250 REQ / 8. APP CODE (A) / 9. INPUT TO IAC (E)	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBM/EVENT (D)	
A00A	DRAWINGS, ENGINEERING & ASSOCIATED LISTS Level 2 (LGTA Mount Design)	NWC Code 3141	See Blk 16	See Blk 16	See Blk 16
DD Form 1664 DI-E-7031	Para 2.3.2.7 of WA#1002	DD		See Blk 16	

16. REMARKS

Reference Blk 10, Para 10.2 of DI-E-7031. Ordering data required by para 6.2 of DOD-D-1000B and submittal instructions are provided by the attached supplement.

15. TOTAL See Blk 16

PREPARED BY	DATE	APPROVED BY	DATE
Naval Weapons Center (Code 3651) China Lake, CA	20 Sep 78	Chairman, NWC Data Requirements Review Board	27 SEP 78

DD FORM 1423 S/N 0102-014-1503 REPLACES EDITION OF 1 APR 65 WHICH IS OBSOLETE

ATCH NR _____ TO EXHIBIT A to WA#1002
TO CONTRACT/PR N00123-79-C-0051

CONTRACT DATA REQUIREMENTS LIST
CATEGORY NA

SYSTEM/ITEM LGTA PROTOTYPE
CONTRACTOR HONEYWELL

1. SEQUENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA / 3. SUBTITLE	8. TECHNICAL OFFICE	10. FREQUENCY	12. DATE OF 1ST SUBMISSION	14. DISTRIBUTION AND ADDRESSEES (Addressee – Regular Copies/Repro Copies)	
4. AUTHORITY (Data Item Number)	5. CONTRACT REFERENCE	7. DD250 REQ / 8. APP CODE (A) / 9. INPUT TO IAC (X)	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBM/EVENT 10		
A007	TECHNICAL REPORT (Thermal Analysis)	NWC Code 3141	OTIME	See Blk 16	NWC 3141	2/0
DD Form 1664 DI-S-1800	Para 2.3.2.2 of WA#1002	LT				

16. REMARKS

Blk 12: Submit Thermal Analysis NLT 15 DA completion of effort.

Tailor DID (DI-S-1800) as follows: Delete the entries in Blks 6 & 9. Delete paras 10.1 and 10.2 of Blk 10. Para 10.3 is applicable. The report shall establish temperature rise and distribution.

Contractor's format is authorized.

15. TOTAL 2/0

A008	TEST PLAN (LC Prototype Gyros)	NWC Code 3141	See Blk 16	See Blk 16	NWC 3141	2/0
DD Form 1664 DI-T-5204	Para 2.3.2.4 of WA#1002	LT / A		See Blk 16		

16. REMARKS

Blk(s) 8, 10, 12 & 13: Submit Test Plan to the NWC Technical Office (Code 3141) for written approval NLT 30 days prior to start of testing. Draft copies not required.

15. TOTAL 2/0

PREPARED BY	DATE	APPROVED BY	DATE
Naval Weapons Center (Code 3651) China Lake, CA	20 Sep 78	Chairman, NWC Data Requirements Review Board	27 SEP 78

DD FORM 1423 S/N 0102-014-1503 PREVIOUS EDITION OF 1 OCT 65, WHICH IS OBSOLETE.

PAGE 2 OF 4 PAGES

ATCH NR _____ TO EXHIBIT A to WA#1002

TO CONTRACT/PR N00123-79-C-0051

CONTRACT DATA REQUIREMENTS LIST

CATEGORY NA

SYSTEM/ITEM LGTA PROTOTYPE

CONTRACTOR HONEYWELL

1. SEQUENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA / b. SUBTITLE	4. TECHNICAL OFFICE	10. FREQUENCY	12. DATE OF 1ST SUBMISSION	14. DISTRIBUTION AND ADDRESSEES (Addressee - Regular Copies Reqrd Copies)	
3. AUTHORITY (Data Item Number)	8. CONTRACT REFERENCE	7. DD/JO REQ / APP CODE (A) / INPUT TO (IAC (X))	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBM/EVENT ID		
A00B	REPORT, TEST (LC Prototype Gyros)	NWC Code 3141	XTIME	See Blk 16	NWC 3141	2/0
DD Form 1664 DI-T-2072	Para 2.3.2.4 of WA#1002	LT				
					TOTAL	2/0

16. REMARKS

Blk 12: Submit results of testing NLT 15 DA final test or series of tests.

Tailor DID (DI-T-2072) as follows: Blk 10 - Para 10.1.b (contractor's format) is applicable. Para 10.2 - The report shall contain the results of the tests performed in accordance with the requirements of WA#1002 and the approved test plan.

PREPARED BY	DATE	APPROVED BY	DATE
Naval Weapons Center (Code 3651) China Lake, CA	20 Sep 78	Dwight L Atkinson Chairman, NWC Data Requirements Review Board	27 SEP 78

DD FORM 1423 S/N 0102-014-1503 REPLACES EDITION OF 1 APR 65, WHICH IS OBSOLETE.

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ENGINEERING DRAWINGS, ASSOCIATED
LISTS AND RELATED DATA REQUIREMENTS

ITEM	PR OR CONTRACT NO.	SUPPLEMENT TO CDRL DATA ITEM A009
LC GYRO ELECTRONICS	ORIGINATOR'S CODE NWC CODE 3141	DATE 20 Sep 78

REQUIREMENTS

In accordance with paragraph 6.2.1 of Military Specification DOD-D-1000B Subj: Drawings, Engineering and Associated Lists dated 28 Oct 77, the following instructions for the preparation of the above referenced data item are herewith furnished. Data Item Description DI-E-7031 applies.

1. LEVEL (DOD-D-1000B) 6.2.1(b)	☐ 1 ☒ 2 ☐ 3
2. DESIGN ACTIVITY (NAME/FSCM/DRWG. NO) 6.2.1(c)	☐ NAVAIR (30003) ☒ CONTRACTOR ☐ OTHER_____ ( )
3. SOURCE OF GOVT. NOs. & FORMATS 6.2.1(d) ☒ NA	SOURCE OF GOVT. NOs. _____ GOVT. DRAWINGS FORMATS FURNISHED ☒ NO ☐ YES SOURCE _____
4. DO ANY PARTS OF MIL-STD-100 APPLY TO LEVEL 1 6.2.1(e)	☐ YES (AMPLIFY) ☐ NO ☒ NOT APPLICABLE
5. APPLICATION OF METRIC SYSTEM 6.2.1(g)	☐ REQUIRED ☒ NOT REQUIRED
6. ACCEPTABILITY OF COMPANY STANDARDS 6.2.1(i)	☒ ACCEPTABLE ☐ NOT ACCEPTABLE
7. ASSOCIATED LISTS 6.2.1(j)& 6.2.1(o)	☒ DATA LIST ☐ INDEX LIST ☐ PARTS LIST SEPARATE ☐ PARTS LIST INTEGRAL ☒ PARTS LIST SEPARATE OR INTEGRAL
8. DRAWING ASSY. LEVEL FOR ASSOC LISTS 6.2.1(k)	DATA LIST: Top Assy. PARTS LIST: Lowest Subassy.
9. APPLICABILITY OF MONO-DETAIL SYSTEM 6.2.1(l)	☒ REQUIRED ☐ NOT REQUIRED
10. TYPES OF ENGINEERING DRAWINGS 6.2.1(m)	☒ CONTRACTOR SELECT. SELECTION SUBJECT TO GOVERNMENT TECHNICAL OFFICE APPROVAL FOR LEVEL 2 AND LEVEL 3 ☐ GOVERNMENT SELECT (SEE REMARKS)

ENGINEERING DRAWINGS, ASSOCIATED
LISTS AND RELATED DATA REQUIREMENTS

11. PREPARATION OF CONTROL DRAWINGS 6.2.1(n)	☒ REQUIRED IF APPLICABLE ☐ NOT REQUIRED
12. DRAWING FORMAT MATERIAL 6.2.1(p)	☐ PAPER ☐ CLOTH ☐ PLASTIC ☒ PAPER, CLOTH OR PLASTIC
13. DRAWING COPY(S) and RELATED DATA 6.2.1(q) & 6.2.1(r)	☐ MICROFILM AND TABULATING CARDS MIL-M-38761/1 ☐ DATA DECK MIL-M-38761/1 ☒ NON-REPRODUCIBLES (BLUELINES) MIL-D-5480 ☒ REPRODUCIBLES (BROWNLINES) MIL-D-5480
14. SPECIAL PACKAGING OF ORIGINALS 6.2.1(t)	☒ NOT REQUIRED ☐ REQUIRED (AMPLIFY): _____

DELIVERY OF DATA

DATA	NUMBER OF COPIES 6.2.1(q)	DAYS AFTER CONTRACT (DAC)	DAYS BEFORE	CONCURRENT WITH	DAYS AFTER	HARDWARE ITEM	DELIVER TO
15. ORIGINALS para 6.2.1(e)							
16. MICROFILM AND TABULATING CARDS MIL-M-38761/1							
17. NON/REPRODUCIBLES MIL-D-5480 BLUELINES	1	(See Remarks Below)					Commander, NWC China Lake, CA 93555 Attn: Rec Ofcr For: Code 3141
18. REPRODUCIBLES MIL-D-5480 BROWNLINES	1	(See Remarks Below)					Commander, NWC China Lake, CA 93555 Attn: Rec Ofcr For: Code 3141

19. REMARKS:

Item 17: Submit copies to Technical Office (Code 3141) NLT 30 days prior to conducting concept review at Honeywell Inc.

Item 18: Retain brownline reproducibles until requested by Technical Office (Code 3141)

ENGINEERING DRAWINGS, ASSOCIATED
LISTS AND RELATED DATA REQUIREMENTS

ITEM	PR OR CONTRACT NO.	SUPPLEMENT TO CDRL DATA ITEM A00A
LGTA MOUNT DESIGN	ORIGINATOR'S CODE NWC CODE 3141	DATE

REQUIREMENTS

In accordance with paragraph 6.2.1 of Military Specification DOD-D-1000B Subj: Drawings, Engineering and Associated Lists dated 28 Oct 77, the following instructions for the preparation of the above referenced data item are herewith furnished. Data Item Description DI-E-7031 applies.

1. LEVEL (DOD-D-1000B) 6.2.1(b)	☐ 1 ☒ 2 ☐ 3
2. DESIGN ACTIVITY (NAME/FSCM/DRWG. NO) 6.2.1(c)	☐ NAVAIR (30003) ☒ CONTRACTOR ☐ OTHER_____ ( )
3. SOURCE OF GOVT. NOs. & FORMATS 6.2.1(d) ☒ NA	SOURCE OF GOVT. NOs. _____ GOVT. DRAWINGS FORMATS FURNISHED ☒ NO ☐ YES SOURCE _____
4. DO ANY PARTS OF MIL-STD-100 APPLY TO LEVEL 1 6.2.1(e)	☐ YES (AMPLIFY) ☐ NO ☒ NOT APPLICABLE
5. APPLICATION OF METRIC SYSTEM 6.2.1(g)	☐ REQUIRED ☒ NOT REQUIRED
6. ACCEPTABILITY OF COMPANY STANDARDS 6.2.1(i)	☒ ACCEPTABLE ☐ NOT ACCEPTABLE
7. ASSOCIATED LISTS 6.2.1(j)& 6.2.1(o)	☒ DATA LIST ☐ INDEX LIST ☐ PARTS LIST SEPARATE ☐ PARTS LIST INTEGRAL ☒ PARTS LIST SEPARATE OR INTEGRAL
8. DRAWING ASSY. LEVEL FOR ASSOC LISTS 6.2.1(k)	DATA LIST: Top Assembly PARTS LIST: Lowest Subassembly
9. APPLICABILITY OF MONO-DETAIL SYSTEM 6.2.1(l)	☒ REQUIRED ☐ NOT REQUIRED
10. TYPES OF ENGINEERING DRAWINGS 6.2.1(m)	☒ CONTRACTOR SELECT. SELECTION SUBJECT TO GOVERNMENT TECHNICAL OFFICE APPROVAL FOR LEVEL 2 AND LEVEL 3 ☐ GOVERNMENT SELECT (SEE REMARKS)

ENGINEERING DRAWINGS, ASSOCIATED
LISTS AND RELATED DATA REQUIREMENTS

11. PREPARATION OF CONTROL DRAWINGS 6.2.1(n)	☒ REQUIRED IF APPLICABLE ☐ NOT REQUIRED
12. DRAWING FORMAT MATERIAL 6.2.1(p)	☐ PAPER ☐ CLOTH ☐ PLASTIC ☒ PAPER, CLOTH OR PLASTIC
13. DRAWING COPY(S) and RELATED DATA 6.2.1(q) & 6.2.1(r)	☐ MICROFILM AND TABULATING CARDS MIL-M-38761/1 ☐ DATA DECK MIL-M-38761/1 ☒ NON-REPRODUCIBLES (BLUELINES) MIL-D-5480 ☒ REPRODUCIBLES (BROWNLINES) MIL-D-5480
14. SPECIAL PACKAGING OF ORIGINALS 6.2.1(t)	☒ NOT REQUIRED ☐ REQUIRED (AMPLIFY):

DELIVERY OF DATA

DATA	NUMBER OF COPIES 6.2.1(q)	DAYS AFTER CONTRACT (DAC)	DAYS BEFORE	CONCURRENT WITH	DAYS AFTER	HARDWARE ITEM	DELIVER TO
15. ORIGINALS para 6.2.1(e)							
16. MICROFILM AND TABULATING CARDS MIL-M-38761/1							
17. NON/REPRODUCIBLES MIL-D-5480 BLUELINES	1	(See Remarks Below)					Commander, NWC China Lake, CA 93555 Attn: Rec Ofcr For: Code 3141
18. REPRODUCIBLES MIL-D-5480 BROWNLINES	1	(See Remarks Below)					Commander, NWC China Lake, CA 93555 Attn: Rec Ofcr For: Code 3141

19. REMARKS:

Item 17: Submit copies to Technical Office (Code 3141) NLT 30 days prior to conducting concept review at Honeywell Inc.
Item 18: Retain brownline reproducibles until requested by Technical Office (Code 3141).

DATA ITEM DESCRIPTION	2. IDENTIFICATION NO(S)	
	AGENCY	NUMBER
1. TITLE TECHNICAL REPORTS	Army	DI-S-1800

3. DESCRIPTION/PURPOSE

Technical Reports (TR) can be issued periodically, when technical information is suitable for dissemination, or when the effort is complete. They are used to evaluate progress or determine the technical merit of the item being developed, the analysis being performed or investigation being conducted, and to disseminate current scientific and/or technical information.

4. APPROVAL DATE
15 Dec 69

5. OFFICE OF PRIMARY RESPONSIBILITY
USAMC

6. DDC REQUIRED
X

7. APPLICATION/INTERRELATIONSHIP

8. APPROVAL LIMITATION

9. REFERENCES (Mandatory as cited in block 10)
AR 70-31

MCSL NUMBER(S)

10. PREPARATION INSTRUCTIONS

Prepare documentation of the results of the efforts in technical reports specified on DD Form 1423 as follows:

1. A letter progress report shall contain brief statements on the status of the project, the objectives and procedures performed, data and results obtained to date and proposed program for the next reporting period.

2. An interim technical report, when required, shall formally document the efforts and results of the period and at the date specified on DD Form 1423.

3. A final technical report shall formally document all efforts and results on the project and be delivered as specified on DD Form 1423. The format of the report depends on the nature of the work and in general the report shall contain:

a. Aims and objectives
b. Positive and negative results of effort supported by significant data
c. Problems encountered and their solution.
d. References used (Publications, lectures, conferences, reports, etc.)
e. Calculations required for complete definition
f. Tables and charts of results and significant data
g. Other applicable data and calculations generated in the program
h. Photographs, drawings, etc. required for adequate description
i. Conclusions and recommendations

DD FORM 1664 S/N 0102-014-4600 PAGE 1 OF 1 PAGES

DATA ITEM DESCRIPTION	2. IDENTIFICATION NO(S)	
	AGENCY	NUMBER
1. TITLE Reports , Test	NAVY	DI-T-2072/ UDI-T-20206
4. DESCRIPTION/PURPOSE This Item specifies a uniform content and format to be used in the preparation of test reports covering tests on systems, sub-systems, components and parts.	5. APPROVAL DATE 1972 August 11	
	6. OFFICE OF PRIMARY RESPONSIBILITY (& users) DS (AS,EC,YD,SH,SA)	
	8. DOC REQUIRED N/A	
	9. APPROVAL LIMITATION N/A	
7. APPLICATION/INTERRELATIONSHIP 7.1 Applicable to all procurement actions wherein test reports are required as a result of testing except those instances where scientific or engineering reports are required.	10. REFERENCES (Mandatory as cited in Block 16) MIL-STD-831	
	MCSL NUMBER(S) N/A	

16. PREPARATION INSTRUCTIONS

10.1 The format of test reports shall be in accordance with para 10.1.a below unless para 10.1.b is cited on DD Form 1423.

10.1.a MIL-STD-831 of the issue in effect on the date of the solicitation unless otherwise indicated in the contract.

10.1.b CONTRACTOR FORMAT

10.2 The Technical content of a specific test covered by the test report shall be indicated by citing that portion of the applicable document (MIL. SPEC, WS, ETC) in block 16 of the DD Form 1423.

DD FORM 1664 S/N-0102-019-4000 PLATE NO. 18446 PAGE 1 OF 1 PAGES

★U.S. GOVERNMENT PRINTING OFFICE: 1971—714-677/1696 0-1

D-6617

DATA ITEM DESCRIPTION	2. IDENTIFICATION NO.(S)	
	AGENCY	NUMBER
1. TITLE: Test Plan	NSA	DI-T-5204
3. DESCRIPTION/PURPOSE: Provide a document that describes the planning and preparation for test and the performance tests to be conducted at each level of assembly appropriate to the end items to be delivered.	4. APPROVAL DATE: 29 September 1972	
	5. OFFICE OF PRIMARY RESPONSIBILITY: NSA-R	
	6. DOC REQUIRED: N/A	
	8. APPROVAL LIMITATION: N/A	
7. APPLICATION/INTERRELATIONSHIP: Documents the total test program to be established for evaluation of hardware conformance to performance requirements.	9. REFERENCES (Mandatory as cited in Block 10)	
	MCSL NUMBER(S): N/A	

10. PREPARATION INSTRUCTIONS

1. The contractor shall prepare a test plan that describes test objectives and the tests to be conducted. The following minimum information shall be included, as applicable:

a. Test purpose/objectives
b. Identify each assembly to be tested, to include printed circuit cards, equipment group, subsystem, system levels.
c. Describe test set up at each level of test, including diagrams and sketches to illustrate the test set-up.
d. Describe or identify all test equipment required, including special jigs and fixtures.
e. Describe all test procedures, including test sequence, test parameters and participants.
f. Provide sample test data sheets to illustrate test data to be documented and delivered at each level of test.
g. Establish criteria for acceptance at each level of test and describe the procedures to be followed in the event of malfunction or failure.
h. Identify critical or unusual tests or test conditions
i. Overall test schedule.

2. The title page for the document shall contain the contract number, contractor's name, security classification, equipment or purchase description identification, document title.

DD FORM 1664

DATA ITEM DESCRIPTION

2. IDENTIFICATION NO(S.)	
AGENCY	NUMBER
DOD	DI-E-7031

1. TITLE

Drawings, Engineering and Associated Lists

3. DESCRIPTION/PURPOSE

3.1 Provides information necessary for the acquisition of Engineering Drawings and Associated Lists to satisfy Government requirements of Level 1 (Conceptual and Developmental design); Level 2 (Production Prototype and Limited Production); and Level 3 (Production), as defined in DOD-D-1000B.

4. APPROVAL DATE

31 May 1977

5. OFFICE OF PRIMARY RESPONSIBILITY

AR

6. DOC REQUIRED

8. APPROVAL LIMITATION

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description, is approved for use in conjunction with referenced documents (Block 9) when the later is incorporated in the contractual document as tasks to prepare Engineering Drawings and Associated Lists. When listed on DD FORM 1423, it will provide the requirements for acquisition of Engineering Drawings and Associated Lists as applicable to the "Level" specified in Block 3 of the DD FORM 1423, or referenced documents.

7.2 This DID replaces DI-E-7013A, DI-E-7014A and DI-E-7015A.

9. REFERENCES (Mandatory as cited in Block 10)

DOD-D-1000B
MIL-STD-100B

MCSL NUMBER(S)

10. PREPARATION INSTRUCTIONS

10.1 Unless otherwise indicated, documents cited in DOD-D-1000B and MIL-STD-100B form a part of this data item to the extent specified.

10.2 Level 1, 2 or 3 Engineering Drawings and Associated Lists ordered for delivery shall meet the requirements of DOD-D-1000B and as defined on DD FORM 1423, in accordance with the Ordering Data (paragraph 6.2) of DOD-D-1000B, as attached or included in the contract or order.

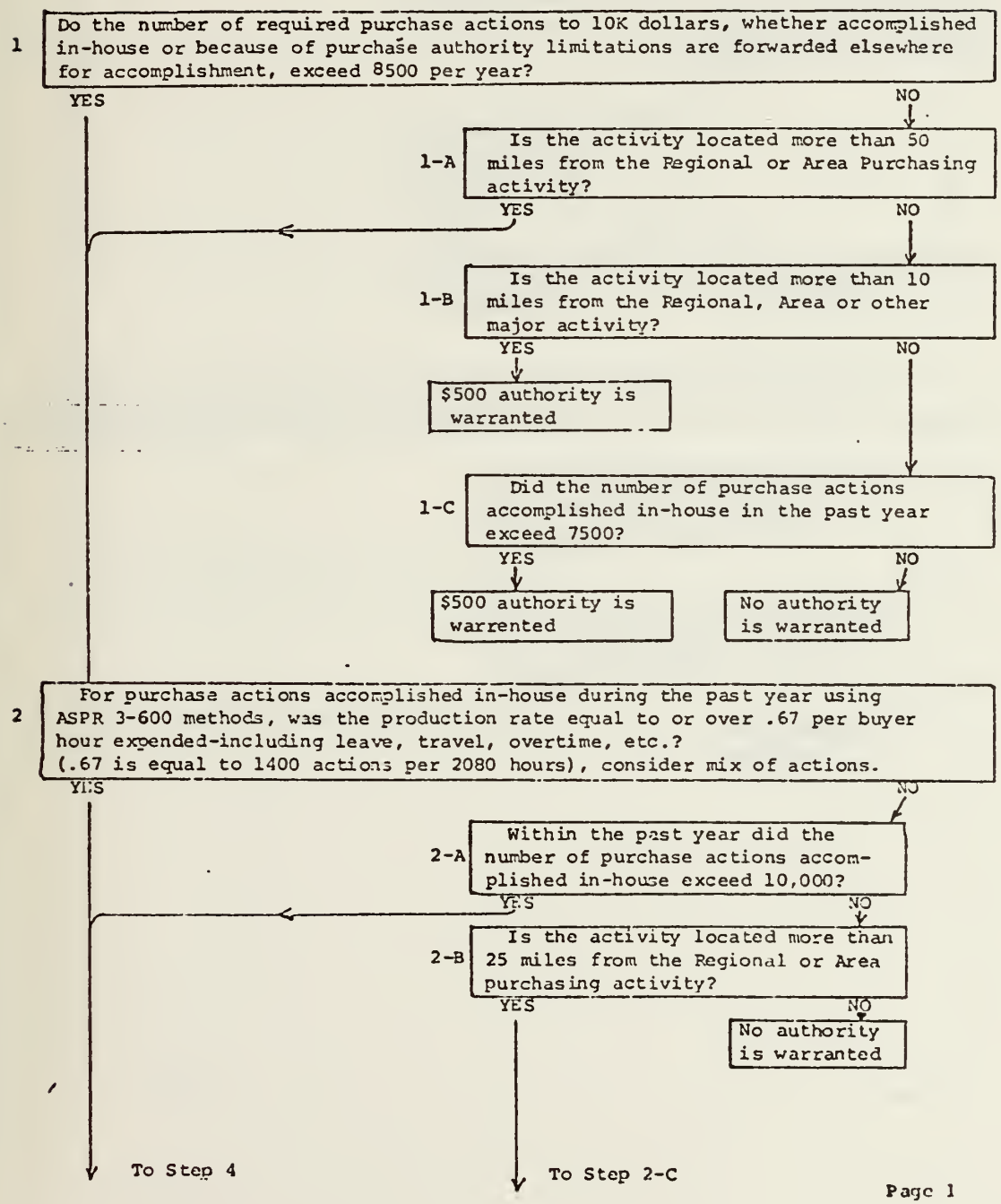
10.3 Selection of the specific types of engineering drawings, as defined in MIL-STD-100B, required to meet a Level 2 or Level 3 procurement is the responsibility of the contractor, unless otherwise specified in the contract or order, which may exclude certain types, thereby permitting all other types as defined in MIL-STD-100B.

APPENDIX C

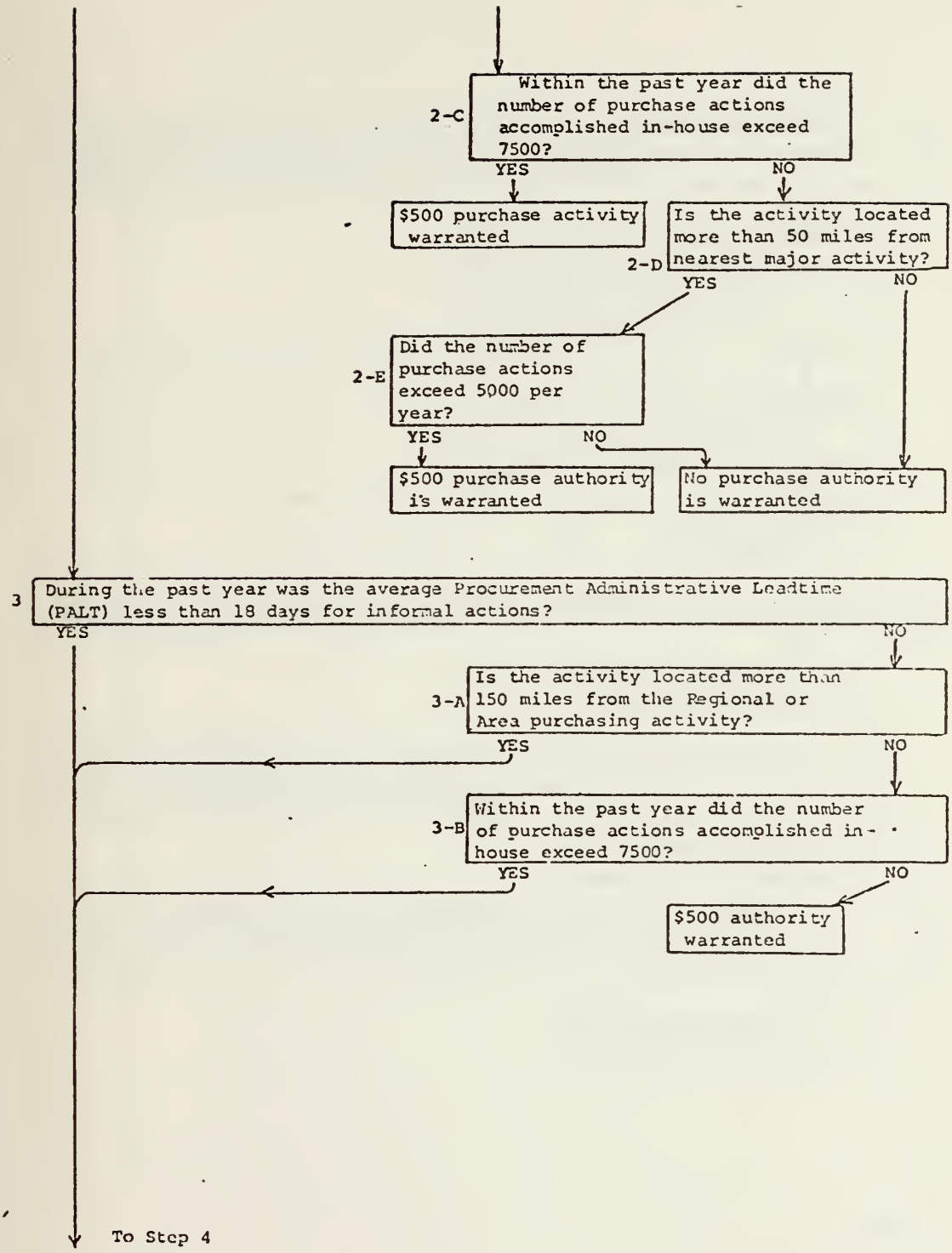
(Source: Naval Supply Systems Command)

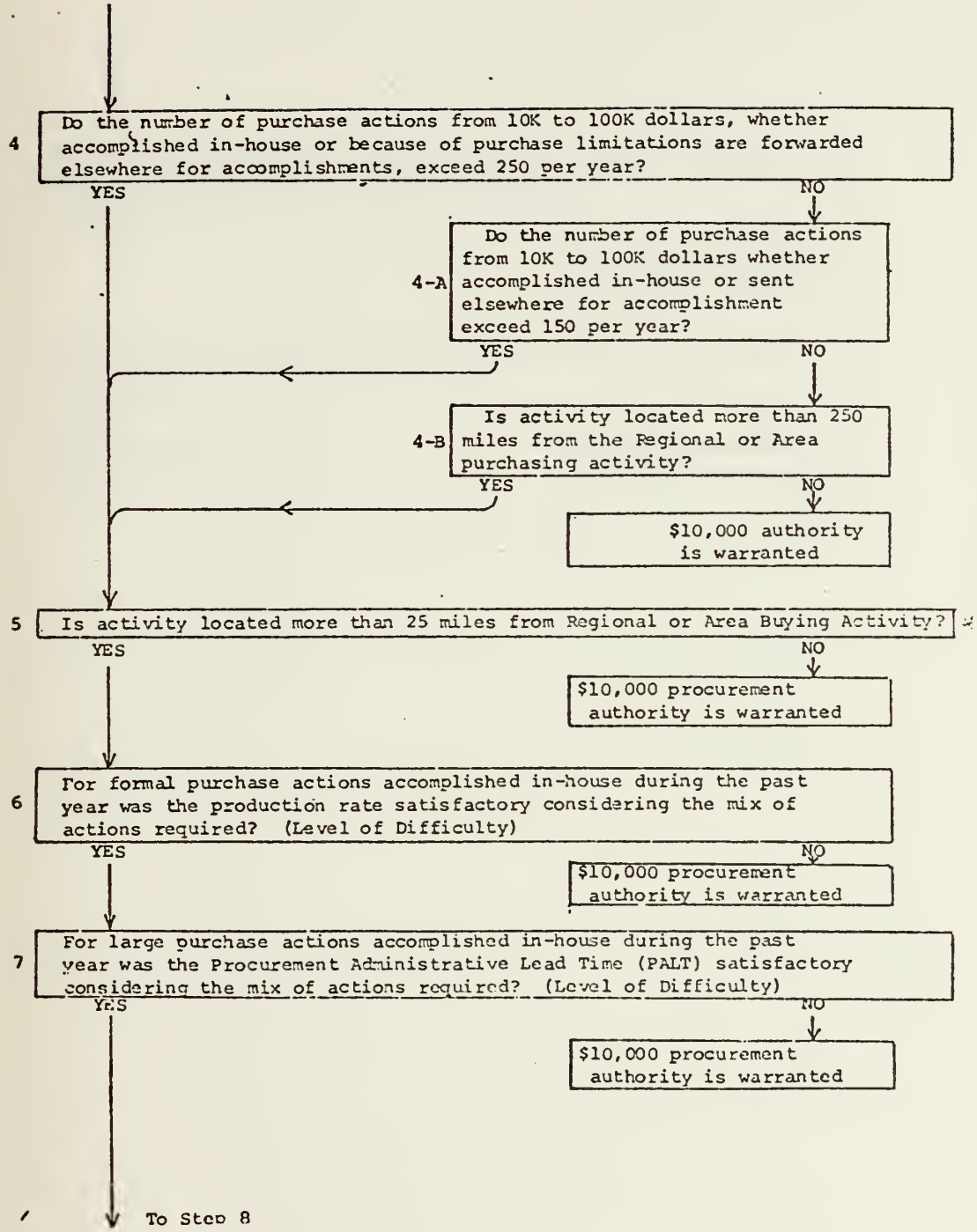
JUNE 1976

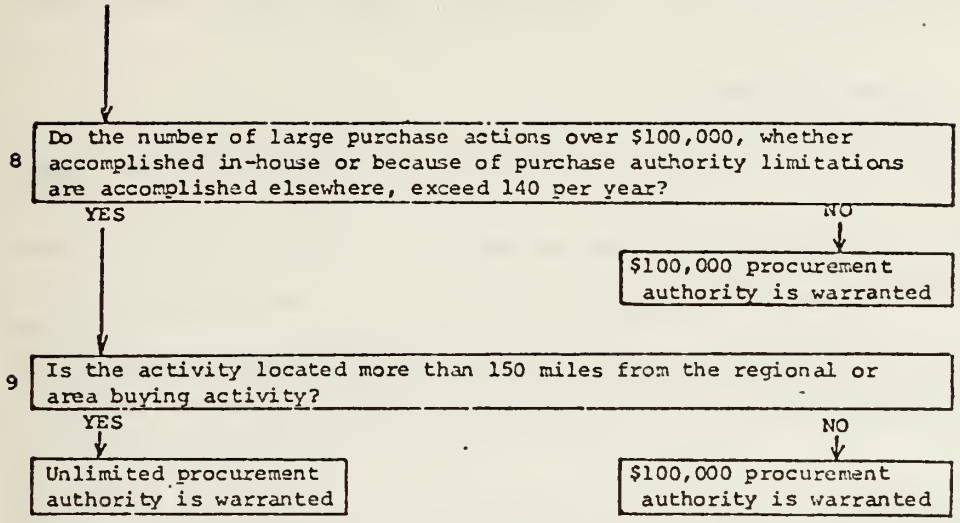
Algorithm For Determining Activity Procurement Authority Levels (Determined Procurement Authority Levels Are $500, $10,000, $100,000 or Unlimited)



Page 1


2-C
Within the past year did the number of purchase actions accomplished in-house exceed 7500?
YES
NO
$500 purchase activity warranted
Is the activity located more than 50 miles from nearest major activity?
2-D
YES
NO
2-E
Did the number of purchase actions exceed 5000 per year?
YES
NO
$500 purchase authority is warranted
No purchase authority is warranted
3
During the past year was the average Procurement Administrative Leadtime (PALT) less than 18 days for informal actions?
YES
NO
3-A
Is the activity located more than 150 miles from the Regional or Area purchasing activity?
YES
NO
3-B
Within the past year did the number of purchase actions accomplished in-house exceed 7500?
YES
NO
$500 authority warranted
To Step 4


4
Do the number of purchase actions from 10K to 100K dollars, whether accomplished in-house or because of purchase limitations are forwarded elsewhere for accomplishments, exceed 250 per year?
YES
NO
4-A
Do the number of purchase actions from 10K to 100K dollars whether accomplished in-house or sent elsewhere for accomplishment exceed 150 per year?
YES
NO
4-B
Is activity located more than 250 miles from the Regional or Area purchasing activity?
YES
NO
$10,000 authority is warranted
5
Is activity located more than 25 miles from Regional or Area Buying Activity?
YES
NO
$10,000 procurement authority is warranted
6
For formal purchase actions accomplished in-house during the past year was the production rate satisfactory considering the mix of actions required? (Level of Difficulty)
YES
NO
$10,000 procurement authority is warranted
7
For large purchase actions accomplished in-house during the past year was the Procurement Administrative Lead Time (PALT) satisfactory considering the mix of actions required? (Level of Difficulty)
YES
NO
$10,000 procurement authority is warranted
To Step 8


8
Do the number of large purchase actions over $100,000, whether accomplished in-house or because of purchase authority limitations are accomplished elsewhere, exceed 140 per year?
YES
NO
$100,000 procurement authority is warranted
9
Is the activity located more than 150 miles from the regional or area buying activity?
YES
NO
Unlimited procurement authority is warranted
$100,000 procurement authority is warranted

APPENDIX D

(Excerpted from NRCO Long Beach Instruction 4330.4)

NRPOINST 4330.4

From: Contracting Officer
To:

Subj: Contracting Officer's Technical Representative (COTR); duties thereof

You have been appointed as the Contracting Officer's Technical Representative under Contract No. _____, Order No. _____ with _____.
As such, your duties are to furnish technical instructions to the contractor which provide specific details, milestones to be met within the terms of the contract or order, and any other instructions of a technical nature necessary to perform the work specified in the contract or order.

You are not to issue any instructions which would constitute a contractual change. You are not to tell the contractor how to perform, but only what is required of a technical nature. If doubt exists as to whether information to be furnished falls within the contract scope of work, contact this office prior to transmitting the information to the contractor.

In your surveillance of the orders, extreme care must be taken to assure that you do not cross the line of personal services. In administering the contract or order, the difference lies within the distinction between surveillance, which is proper and necessary, and supervision which is illegal.

Surveillance becomes supervision when you go beyond enforcing the terms of the contract. If you tell the contractor how, not what to do, the line is being crossed. Then you are using the contractor's personnel as if they were Government employees. You are then transforming the contract into one for personal services. This must be scrupulously avoided.

Specific duties which you are expected to perform include, but are not limited to:

1. Serving as the technical contact through whom the contractor can relay his questions and problems of a technical nature to the Contracting Officer in concert with or through the Ordering Officer. The COTR shall be responsible for all Government technical interface concerning the instant contract or order.

2. Reviewing and evaluating contractors' proposals in order to furnish the PCO or Ordering Officer comments and recommendations.

3. Assisting the Ordering Officer in negotiating revisions to orders and acting as part of the PCO's negotiation team as appropriate.

4. When requested, attending post-award conference.

5. Monitoring contractor compliance with safety requirements.

Enclosure (2)

6. On cost reimbursement, time and material, or labor hour contracts, monitoring contractor performance to see that inefficient or wasteful methods are not being utilized and taking reasonable and timely action to alert the contractor and the Ordering Officer to the situation.

7. Conducting surveillance of contractor performance to determine if the percentage of work performed reasonably corresponds to the percentage of funds expended and alerting the Ordering Officer to any perceived difficulties when such is not the case.

8. Reviewing contractors' progress reports and furnishing the Ordering Officer written comments based on the reports and the COTR's personal observations.

9. Being responsible for acquiring trip reports from all Government personnel visiting the contractor's place of business for the purpose of discussing the instant contract or order. This may entail requesting such reports of personnel in other activities including higher headquarters.

10. Being responsible for assuring that appropriate action is taken on technical correspondence pertaining to the instant contract or order and that adequate files are maintained.

11. Reviewing, in an expeditious manner, contractor invoices and supporting documentation in light of the requirement, progress reports and other input, both documentary and from personal observation, to determine the reasonableness of the billing and its comparability to other documents. This is not invoice certification, in the sense of certifying the facts stated thereon, but is meant to provide the added value of actual payment review. This review must be done expeditiously and should not become a source of undue delay in payment.

12. Alerting the Ordering Officer of any potential performance problems.

13. When performance schedule slippage is identified, determining causative factors and reporting them to the Ordering Officer with proposed actions required to eliminate or overcome the causes and to recover the slippage if feasible. Monitoring the recovery according to the agreed upon plan, reporting significant problems to the Ordering Officer.

14. Promptly furnishing the Ordering Officer with any contractor or technical code request for change, deviation, or waiver, including timely submission of supporting analysis and other required documentation.

15. Promptly furnishing a written completion statement to the Ordering Officer.

16. Being responsible for the timely certification, in writing, to the Ordering Officer of the inspections and acceptance of the services performed upon completion of the task or order.

17. Monitoring, or causing to be monitored, contractor performance using the technique of floor checks. This requires actual on-site observation of the contractor's employees performing under the contract and the review of timecards/sheets or labor distribution schedules to insure the proper charging of time is taking place. DCAA and DCAS cooperation in this effort is essential.

18. When contract provisions require the acquisition of property or material as direct charges and the transfer of title of such property or material to the Government, the COTR shall review the proposed acquisition for reasonableness and shall assist, as required, the assigned Government Property Administrator in identifying proper disposition of said property or material.

The duties and responsibilities set forth herein are not intended to be all inclusive. As specific individual situations arise that have not been covered or that have created a question, bring these to the attention of the Contracting Officer or Ordering Officer and obtain advice on how to proceed in the best interest of the Government.

This appointment shall be effective through the life of the contract; however, failure to comply with the above instructions will result in your termination as a COTR under this contract.

The COTR authority is not redelegable.

Sign and return 3 copies to the PCO _____ Date _____

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